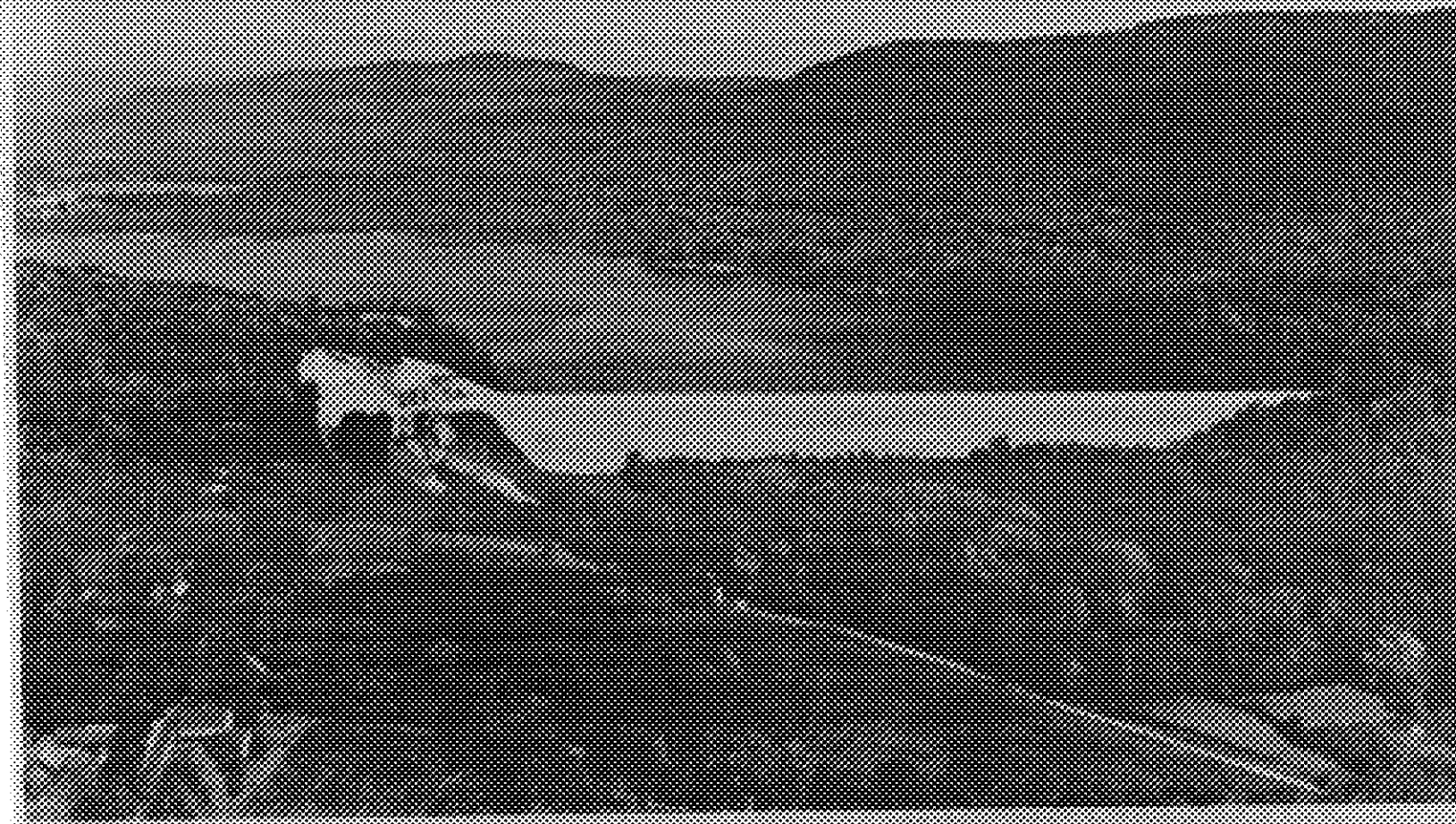
SURRY MOUNTAIN LAKE SURRY, NEW HAMPSHIRE

PROJECT PLAN FOR RECREATION RESOURCES DEVELOPMENT



DESIGN MEMORANDUM

JANUARY 1981

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASSACHUSETTS

SURRY MOUNTAIN LAKE

NEW HAMPSHIRE

PROJECT PLAN

FOR

RECREATION RESOURCES

DEVELOPMENT

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASSACHUSETTS

DECEMBER 1980

PREFACE

This Project Plan provides a comprehensive review of the Corps of Engineers' role in providing outdoor recreation opportunities that enhance fish and wildlife resources, preserve the scenic attractiveness of the reservoir area, and are compatible with the flood control objectives of the project.

The plan has been developed from a study of the recreational requirements of the Surry Mountain Lake region consistent with consideration for the environment, fish and wildlife enhancement and conservation of project resources. Optimum development of recreation facilities with emphasis on quality and compatibility, rather than quantity, have been the primary objectives in planning the recreational use potential of Surry Mountain Lake.

The available recreation facilities offer an important addition to public use opportunities in southwestern New Hampshire, particularly for day-use activities. Important passive recreation opportunities, however, are also available. Planning of the recommended recreational development, as well as preservation and improvement of wildlife and fisheries habitat, has been coordinated with both State and local interests.

WILLIAM E. HODGSON, JR.
Colonel, Corps of Engineers
Acting Division Engineer

ACKNOWLEDGEMENTS

The Surry Mountain Lake Project Plan was developed as a cooperative effort by several people with diverse technical backgrounds and specialties in data research and analysis, land use planning and report preparation.

Douglas A. Cleveland, Supervisory Civil Engineer and Chief of the Recreation and Natural Resources Section, supervised and coordinated the recreational planning analysis and report preparation.

Charles B. Freeman, Division Landscape Architect, participated in originating the recreational development plans and in public coordination.

Captain Marcia J. West, Recreation Resource Planner, prepared most of the report graphics and assisted in developing the recreation plans.

Mark A. Vance, Debora L. Messuri, Catherine A. O'Connell and Mary A. Donovan, all Civil Engineers, assisted in gathering and analyzing data and in writing portions of the Project Plan.

Donald Wood, Hydraulic Engineer, prepared the evaluation of existing water quality conditions.

Frank L. Chisholm, Jr., Engineering Technician, coordinated the report reproduction and graphics preparation.

SUMMARY

Surry Mountain Lake is located in a rural and very scenic area of the upper Connecticut River Basin in southwestern New Hampshire. This moderately developed project has had an annual average of nearly 200,000 visitors over the past five years. The scenic and relatively rustic nature of this area, which offers recreational opportunities for hunting, fishing, hiking, picnicking, boating, water skiing, swimming and snowmobiling, has made Surry Mountain Lake an increasingly popular project.

The Project Plan reflects a desire to provide for practical, optimum use of the project while preserving the unique character of the reservoir area by carefully considering the relationship between the environment, wildlife habitat and recreation facility development. The recommended plan of future development includes improvements to the existing recreation facilities, plus a small group camping area and expansion of the multiuse trail system including a short bicycle trail. Existing fish and wildlife management programs will continue.

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a. Project Authorization and Purposes

Surry Mountain Lake was constructed by the U.S. Army Corps of Engineers under the authority contained in the Flood Control Act approved 22 June 1936 (Public Law No. 738, 74th Congress, as amended by Public Law No. 111, of the 75th Congress, approved 25 May 1937). Surry Mountain Lake was completed and placed in operation in June 1942 at a cost of $2,551,000.

The dam, located on the Ashuelot River, regulates a drainage area of approximately 100 square miles, and is designed to provide flood protection primarily for the downstream community of Keene, New Hampshire. In conjunction with other flood control reservoirs in the Connecticut River Basin, it also contributes to the flood protection of other downstream damage centers along the mainstem of the Connecticut River in Massachusetts and Connecticut. It is estimated that a cumulative amount of $9,860,000 in flood damages have been prevented by Surry Mountain Dam through 1979.

b. Prior Pertinent Reports

A Master Plan for reservoir development was prepared for Surry Mountain Reservoir by the New England Division, U.S. Army Corps of Engineers in April 1966. The Master Plan presented a comprehensive and coordinated program for the development, management and use of the Surry Mountain Flood Control Reservoir area for public recreational purposes.

c. Purpose and Scope

This Project Plan provides a comprehensive and coordinated guide for further development, management, and use of the recreational resources of Surry Mountain Lake. The plan provides recreational programs that are compatible with the authorized project purpose of flood control, and are designed to achieve optimum public use benefits from the available project resources.

A description of project features, evaluation of natural resources, analysis of recreational potential, plan of public use development and discussion of reservoir management are included within the scope of this report. The report represents a culmination of knowledge obtained from past operational experience and project analysis by Federal, State and local interests. The development and subsequent operation required to effect this program has been considered a cooperative endeavor rather than solely a Federal responsibility.

The scope of the Project Plan includes an evaluation of the existing uses of the project lands and waters for public recreational purposes, and their relationship to other recreational opportunities available in the surrounding areas. This plan recommends improvements to the project lands based upon anticipated additional recreational demands.

d. Application of Public Laws

The following public laws outline the authority for construction and operation of Surry Mountain Lake for the multiple-use functions of flood control, recreation and fish and wildlife management.

Public Law 78-534, The Flood Control Act of 1944, as amended, authorizes the Secretary of War (now the Secretary of Defense) to construct, maintain, and operate public park and recreational facilities in reservoir areas, and to grant such leases on land or facilities to non-Federal public bodies as is reasonable and consistent with the major purpose of the dam and reservoir.

Public Law 85-624, the Fish and Wildlife Coordination Act of 1958, directs Federal agencies to coordinate projects which modify bodies of water with the U.S. Fish and Wildlife Service and directs State wildlife resource agencies to determine the extent of damage caused to wildlife. It also charges governmental bodies to promote the development and improvement of such resources by the preparation of wildlife resource plans and reports; to provide assistance in the development, protection, rearing, and stocking of all species of wildlife; to assist in controlling losses from disease; to minimize damages from overabundance by providing public hunting and fishing areas, including easements over public lands thereto; and to provide appropriate measures for the mitigation of lost fish and wildlife resources due to project construction or modification. It further authorizes the modification of, or addition to, projects not completed by March 10, 1934, the date of the original Fish and Wildlife Coordination Act, in order to acquire lands to accommodate the means and measures for the conservation of wildlife resources as integral parts of the project.

Under Public Law 89-72, the Federal Water Project Recreation Act of 1965, where a project has been completed and non-Federal public bodies agree to administer project land and water areas for recreation and fish and wildlife enhancement purposes, and to bear the cost of operation, maintenance, and replacement of existing facilities serving those purposes, such facilities and appropriate project lands may be leased to non-Federal public bodies. At least 50 percent of the separable costs of the proposed recreation development must be borne by the non-Federal public bodies.

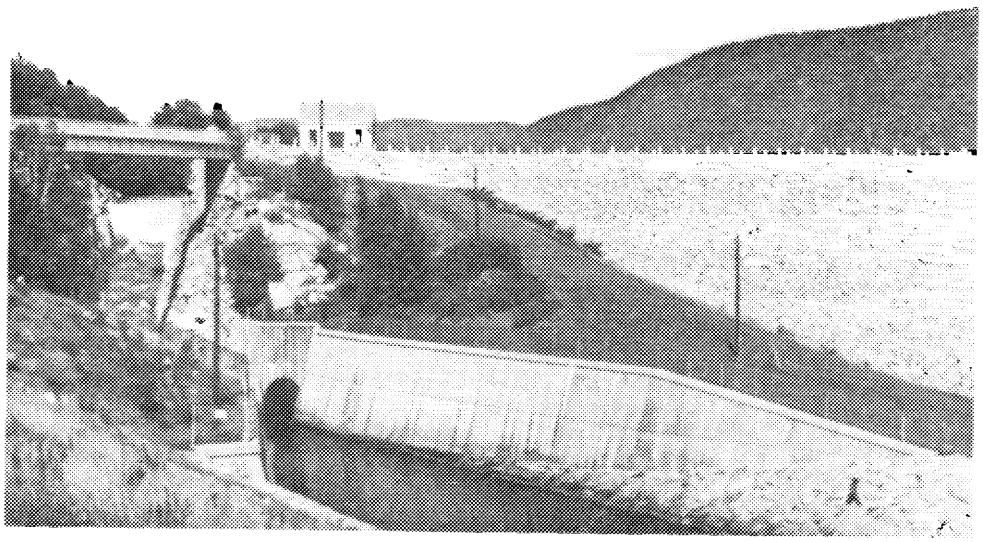


FIGURE 1 SURRY MOUNTAIN LAKE DAM AND SPILLWAY

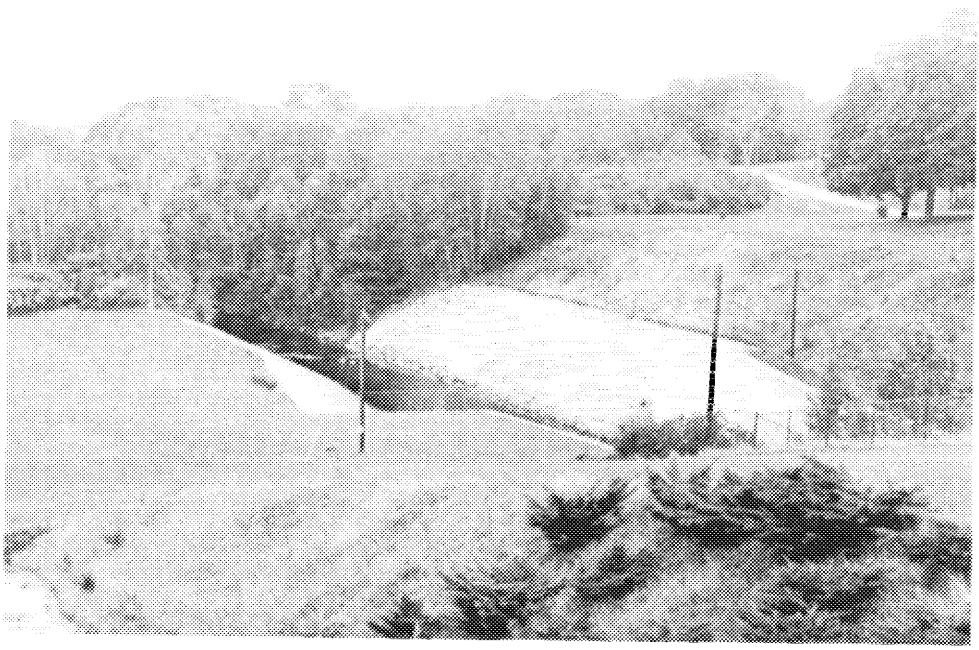


FIGURE 2 DOWNSTREAM SURRY MOUNTAIN SPILLWAY CHANNEL

MATCH LINE

WESTON LOCAL PROT.

BALL MOUNTAIN DAM

TOWNSHEND DAM

BEAVER BROOK DAM (UNDER DESIGN)

SURRY MOUNTAIN DAM

OTTER BROOK DAM

KEENE LOCAL PROT.

HONEY HILL DAM (UNDER RESTUDY)

TULLY DAM

BIRCH HILL DAM

GARDNER LOCAL PROT.

KNIGHTVILLE DAM

LITTLEVILLE DAM

HOLYOKE LOCAL PROT.

NORTHAMPTON LOCAL PROT.

CHICOPEE LOCAL PROT.

CHICOPEE FALLS LOCAL PROT.

RIVERDALE LOCAL PROT.

WESTFIELD LOCAL PROT.

SPRINGDALE LOCAL PROT.

THREE RIVERS LOCAL PROT.

SPRINGFIELD LOCAL PROT.

COLEBROOK RIVER DAM

MAD RIVER DAM

SUCKER BROOK DAM

WEST SPRINGFIELD LOCAL PROT.

BARRE FALLS DAM

WARE LOCAL PROT.

WEST WARREN LOCAL PROT.

CONANT BROOK DAM

HARTFORD LOCAL PROT.

EAST HARTFORD LOCAL PROT.

COMPLETED PROJECT

* SMALL FLOOD CONTROL PROJECTS NOT SPECIFICALLY AUTHORIZED BY CONGRESS

RADIO GAGING STATION

CONNECTICUT RIVER BASIN

SHEET 2 OF 2

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS WALTHAM, MASS.

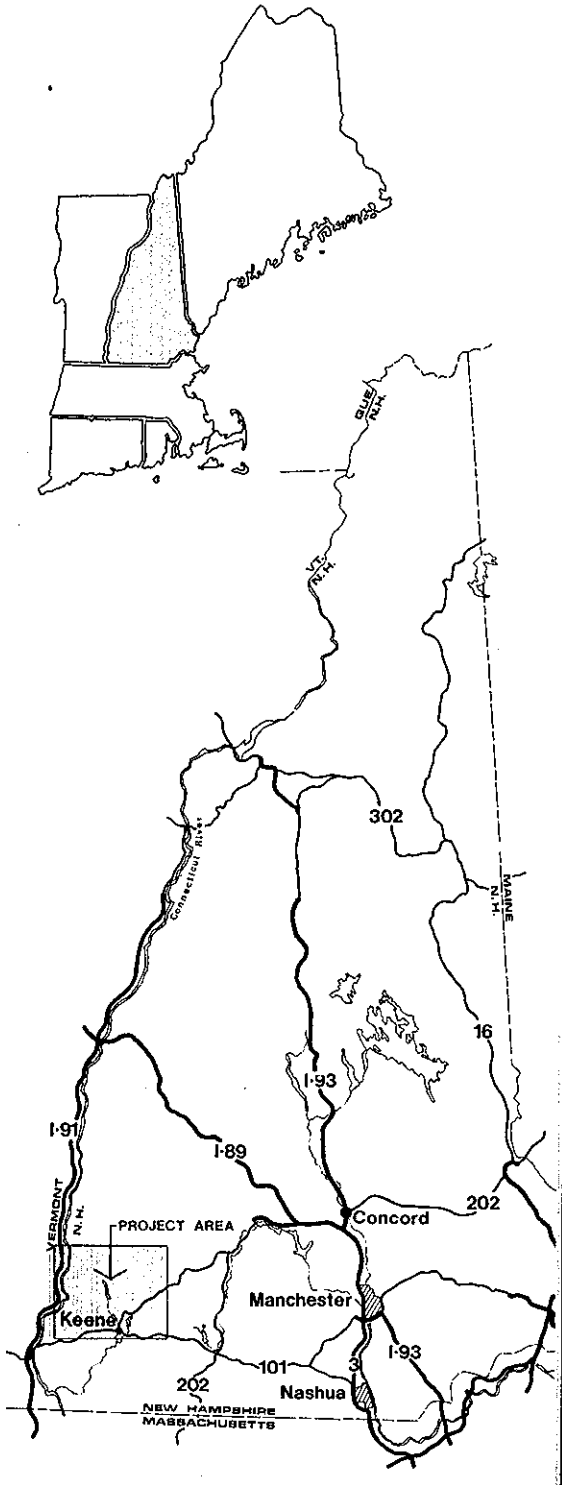
SCALE IN MILES 4 0 4 8

Figure 3

SURRY MOUNTAIN LAKE

SURRY
NEW HAMPSHIRE

VICINITY MAP



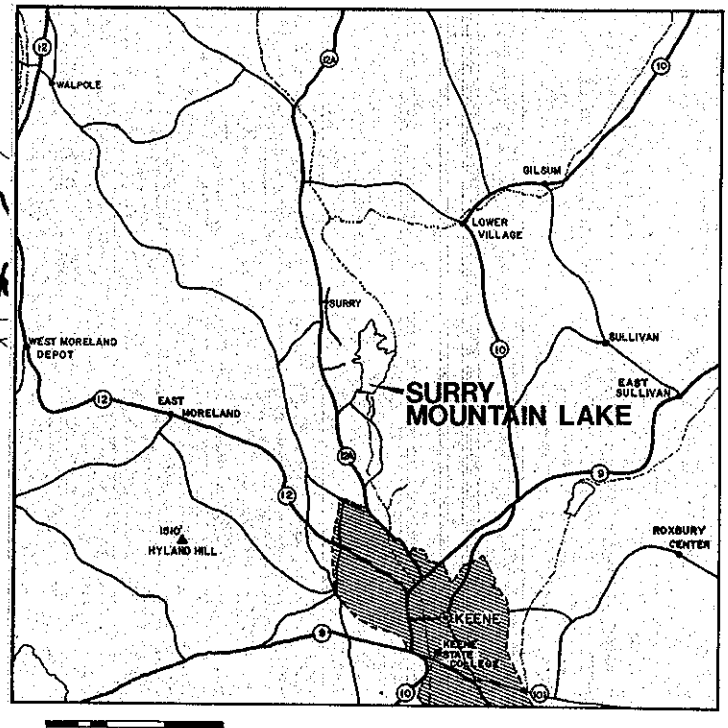


Figure 4

II. PROJECT DESCRIPTION

a. Location

Surry Mountain Lake is located in the town of Surry, Cheshire County, New Hampshire, on the Ashuelot River. The project is about 5 miles north of the city of Keene and approximately 35 river miles above the confluence of the Ashuelot and Connecticut Rivers. Relocated State Route 12A parallels the west side of the reservoir, while access to the dam is provided by former Route 12A.

b. Project Data

Project Structures

Surry Mountain Dam consists of a rolled earthfill embankment with rock slope protection. The embankment is approximately 1,800 feet in length with a maximum height of 86 feet above the stream bed. The top of the embankment is at an elevation of 568 feet above mean sea level (msl) which includes 12.4 feet of spillway surcharge plus 5.6 feet of freeboard. The spillway, located at the west abutment, consists of a 338-foot L-shaped side channel ogee weir with a crest elevation at 550 feet msl.

The outlet works consist of an approach channel, intake structure, discharge conduit and discharge channel. A Boston Horseshoe conduit 10 feet in diameter and 383 feet in length passes through the foundation of the embankment to the 2000-foot long discharge channel which in turn empties into the Ashuelot River at the downstream toe of the embankment. The gate structure contains two 4'6" x 10' cable operated broome gates for regulating purposes, and one similar sized emergency gate in series with the regulating gates.

Reservoir General Character

The reservoir when filled to the spillway crest elevation (550 feet msl) has a total capacity of approximately 33,000 acre feet, which is equivalent to 6.2 inches of runoff from the 100-square mile drainage area that Surry Mountain Dam controls. At this elevation the reservoir would have a surface area of approximately 970 acres and extend upstream approximately 3.5 miles.

The permanent 265-acre recreation lake, held at elevation 500 feet msl by a concrete weir upstream of the flood control gates, was established in 1962 with a capacity of approximately 1,320 acre feet. Maximum depth at the dam is 15 feet and the mean depth of the lake is about 5 feet. During the winter months the lake depth is maintained at 17 feet in order to submerge the flood control gates keeping them ice-free and operational. The lake shoreline is approximately 22,000 feet in length.

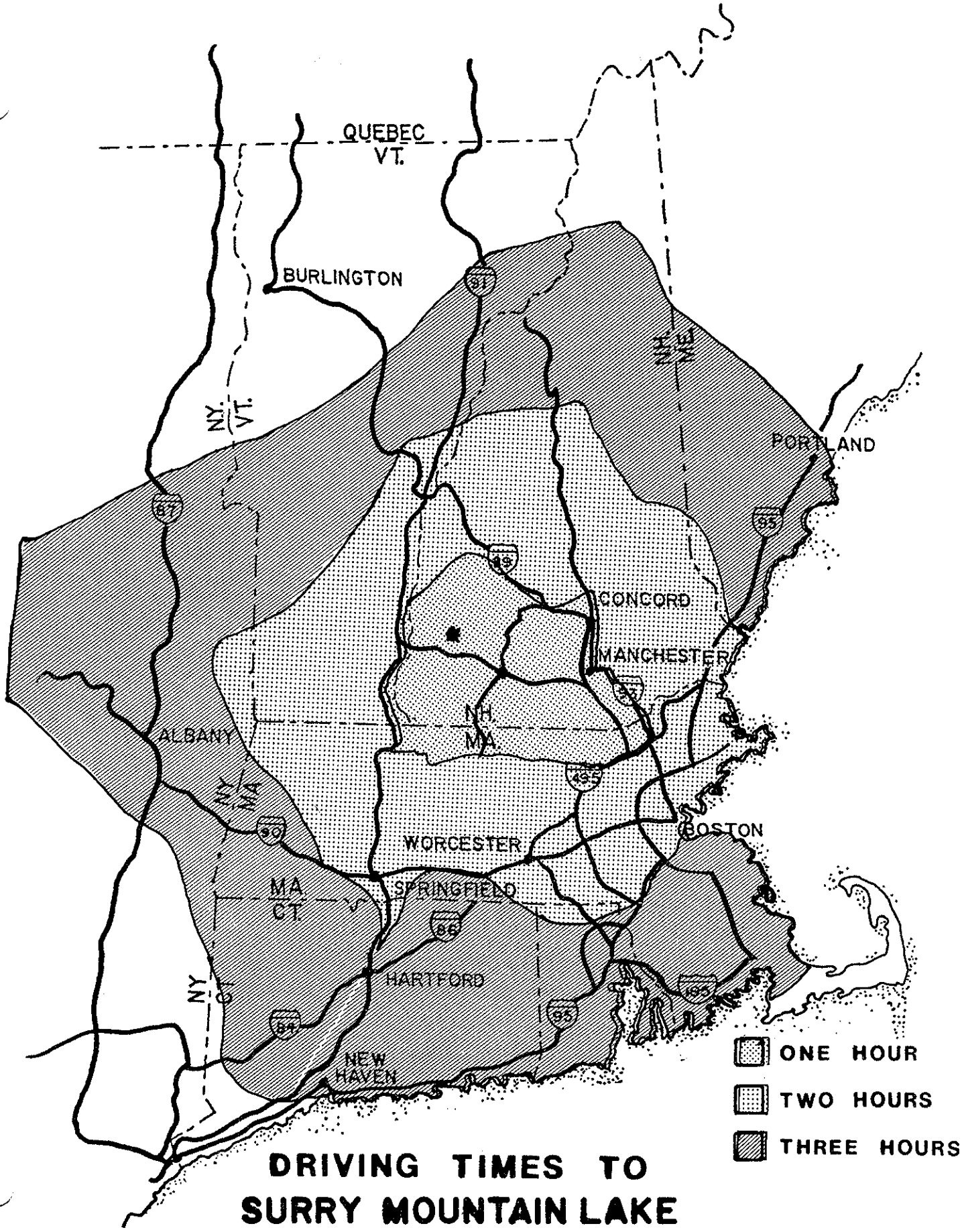
Basin Hydrologic and Climate Survey

Southern New Hampshire has a variable climate characterized as humid continental with four distinct seasons. The region lies in the path of the prevailing westerlies, a belt of generally eastward air movement in the middle latitudes. The irregular procession of contrasting warm and cold air masses is frequently accompanied by the passage of storms. These storms often include abrupt changes in temperature, wind direction and speed, with occasional heavy precipitation and thunderstorms. In addition to frontal storms of inland continental origin, three other types of storms can affect the area. Atlantic coastal storms, locally known as "northeasters," can bring heavy rain or snow accompanied by strong northeast winds circulating counterclockwise around the low pressure center. Storms of tropical origin, sometimes of hurricane intensity, can also affect the region, primarily in the summer or fall. While these storms only rarely maintain hurricane force winds, more frequently they may cause damage by heavy rainfall. During the warm humid days of summer, local convective activity can also produce thunderstorms like those occurring with frontal system movement.

The mean annual precipitation over the Ashuelot River watershed is approximately 40 inches, distributed uniformly throughout the year. Monthly rainfall records at Keene, located approximately 5 miles south of the dam, vary from a maximum of 11.09 inches in July to a minimum of 0.02 inches in September with the mean being 3.30 inches. The average annual temperature at Keene is about 46°F. Average monthly temperatures vary widely throughout the year from approximately 21°F in January to 69°F in July. Extremes in temperature have ranged from a low of minus 32° in January and February to a high of 104° in July. The mean annual snowfall at Keene is 63.3 inches, with 52 percent occurring in January and February.

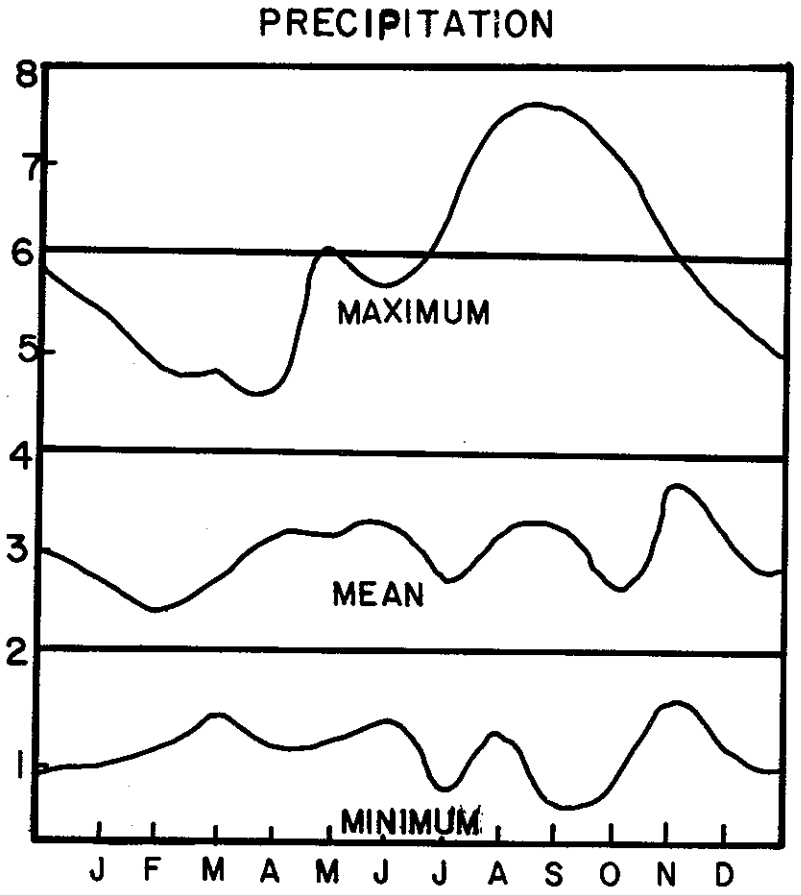
c. Visitation

Public utilization of Surry Mountain Lake has averaged approximately 145,000 visitors annually from 1971 through 1974. From 1975 through 1979 project visitation showed a steady increase from approximately 180,000 in 1975 to nearly 230,000 in 1978. However, visitation in 1979 declined to 145,000 due to flood control operations. People utilize this project year-round for such leisure activities as sightseeing, swimming, picnicking, fishing, hunting, hiking, cross country skiing, boating, water skiing and snowmobiling. The major activities are sightseeing and picnicking which account for more than half of the total visitation, while swimming accounts for approximately one-third of the total. Visitation data collected by the Corps of Engineers are illustrated on the following pages. The data indicate a general trend upward toward more active recreation, although attendance figures vary in response to weather and flood control operations.



DRIVING TIMES TO SURRY MOUNTAIN LAKE

Figure 5


PRECIPITATION
8
7
6
5
4
3
2
1
MAXIMUM
MEAN
MINIMUM
J F M A M J J A S O N D

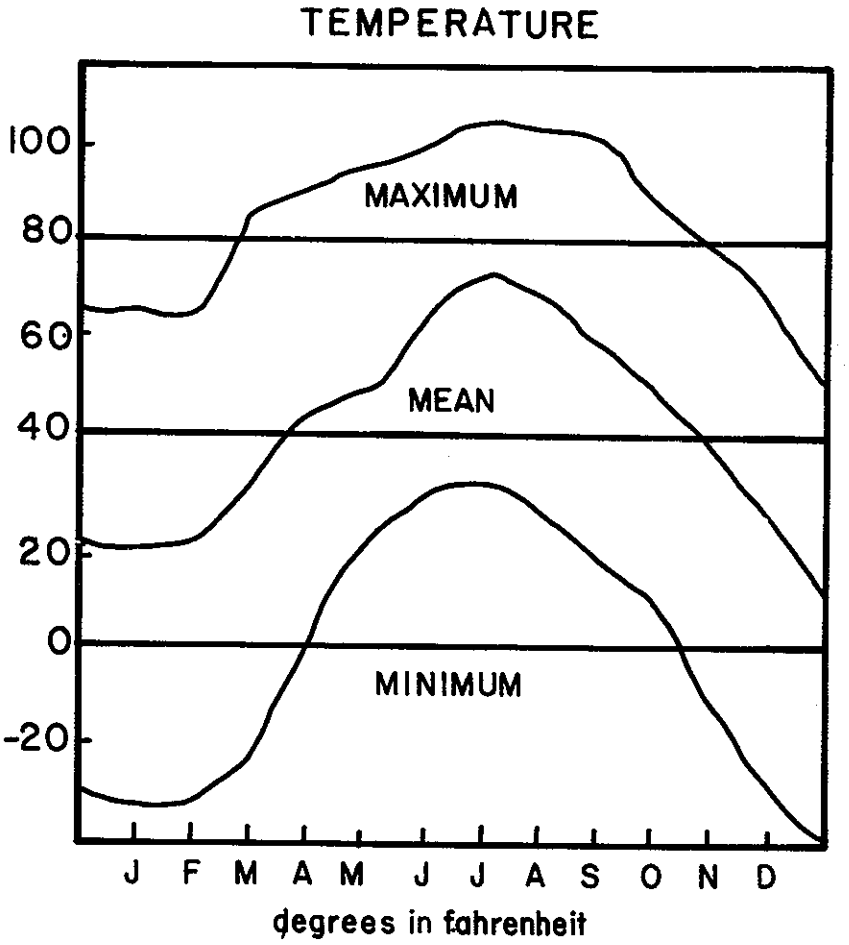

TEMPERATURE
100
80
60
40
20
0
-20
MAXIMUM
MEAN
MINIMUM
J F M A M J J A S O N D
degrees in fahrenheit

Figure 6

TABLE 1

RESERVOIR OPERATIONS

DATE	MAX ELEVATION	STORAGE UTILIZED		
		INCHES	ACRE FEET	%
27 Apr 44	525	2.15	11,530	36
23 Mar 45	524	1.94	10,590	33
18 Apr 47	526	2.28	12,370	39
29 Mar 48	542	4.59	24,800	79
30 Nov 50	528	2.44	13,310	42
12 Apr 51	535	3.49	18,710	59
16 Apr 52	529	2.64	14,050	44
2 Apr 53	539	3.98	21,540	68
3 May 56	536	3.51	18,950	60
7 Apr 60	540	4.13	22,380	71
11 Apr 62	526	2.18	11,920	38
6 Apr 63	517	1.20	6,650	21
17 Apr 64	518	1.31	7,240	23
25 Mar 68	529	2.64	14,050	44
25 Apr 69	541	4.27	22,980	73
14 Apr 72	518	1.4	7,300	23
19 Mar 73	517	1.2	6,550	21
1 Apr 76	521	1.7	9,180	29
16 Mar 77	530	2.8	15,140	49
12 Mar 79	535	3.47	18,503	57
26 Mar 79	526	2.26	12,072	38

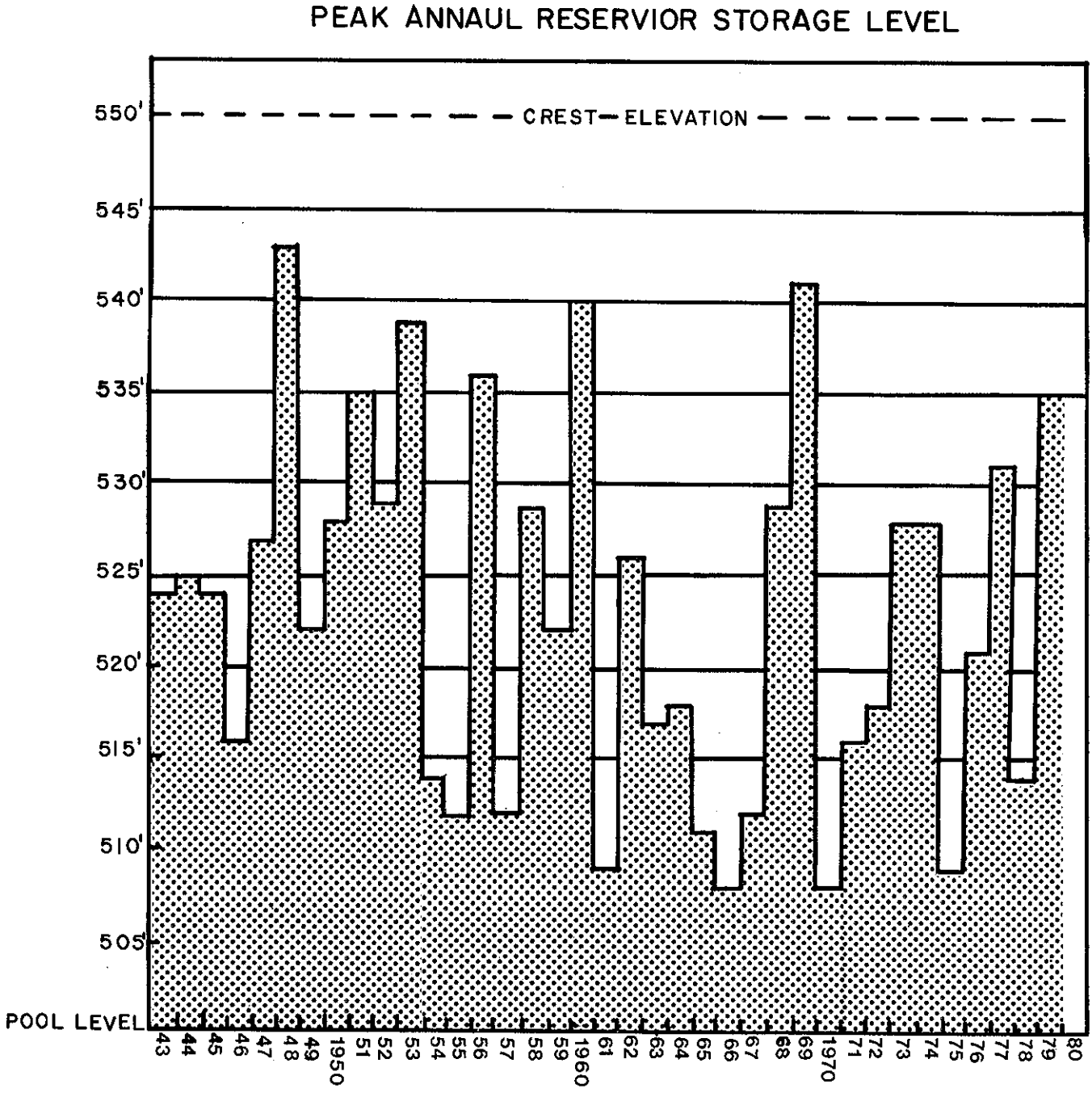
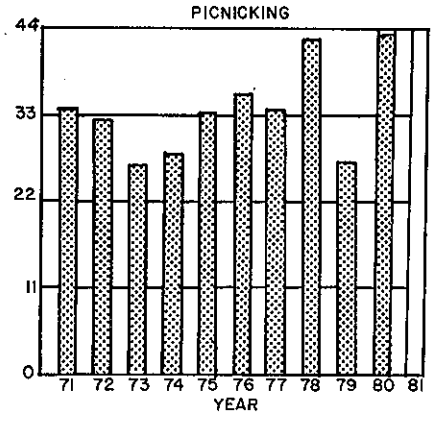
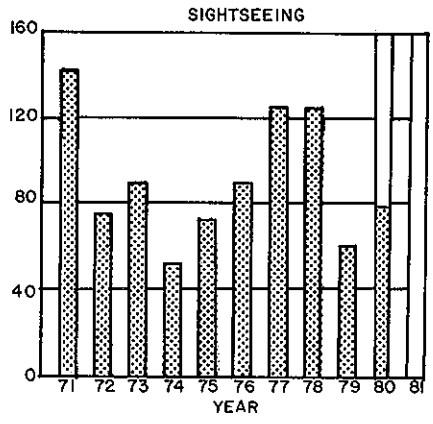

PEAK ANNAUL RESERVIOR STORAGE LEVEL
CREST ELEVATION
550'
545'
540'
535'
530'
525'
520'
515'
510'
505'
POOL LEVEL
43
44
45
46
47
48
49
1950
51
52
53
54
55
56
57
58
59
1960
61
62
63
64
65
66
67
68
69
1970
71
72
73
74
75
76
77
78
79
80

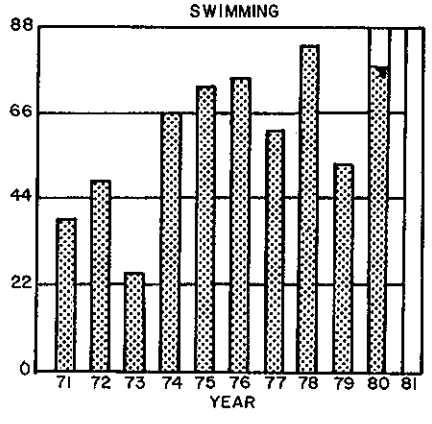
Figure 7

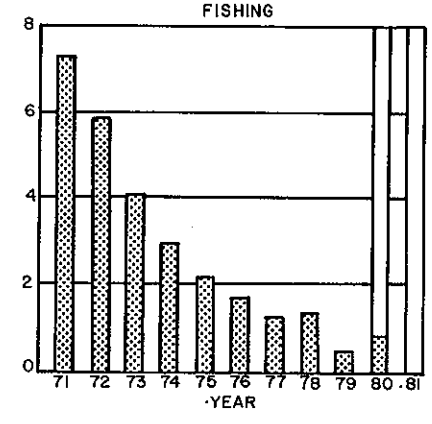
With the ever increasing public demand for outdoor recreational activities, an area that retains its natural qualities while providing the resources for a variety of recreational uses can be expected to be in constant demand. Being located in close proximity to a growing population makes this project attractive to the local area, especially in times of increasing transportation costs.

VISITATION DATA
(Annual Attendance in Thousands)









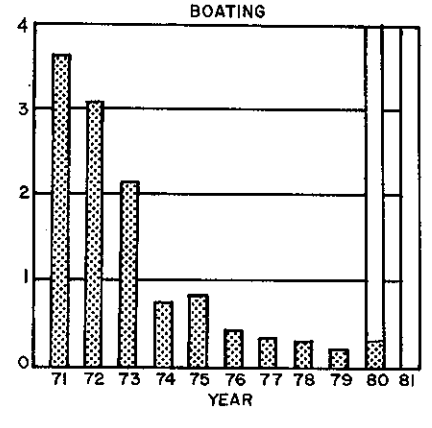
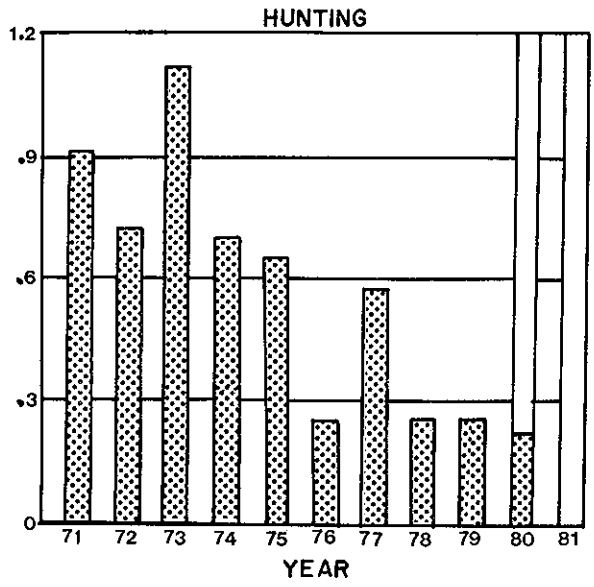
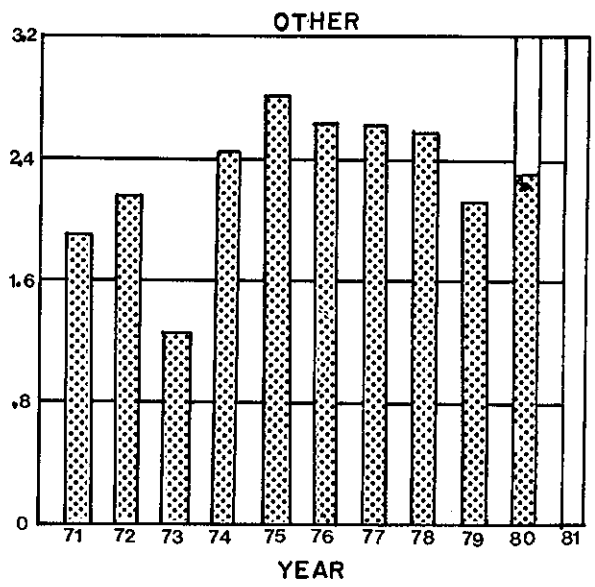


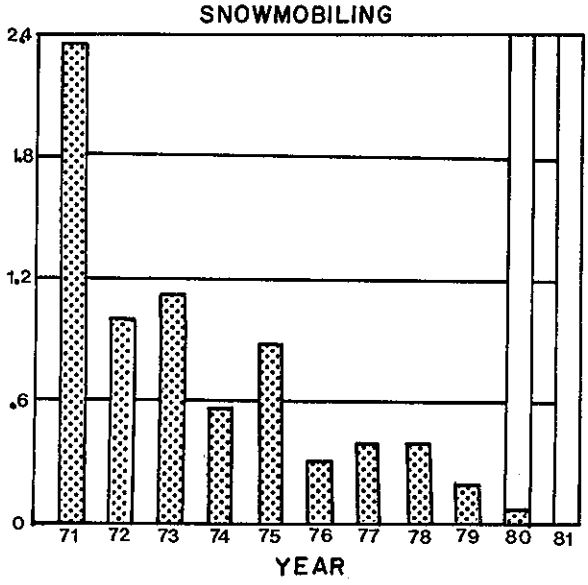
Figure 8

VISITATION DATA

(Annual Attendance in Thousands)







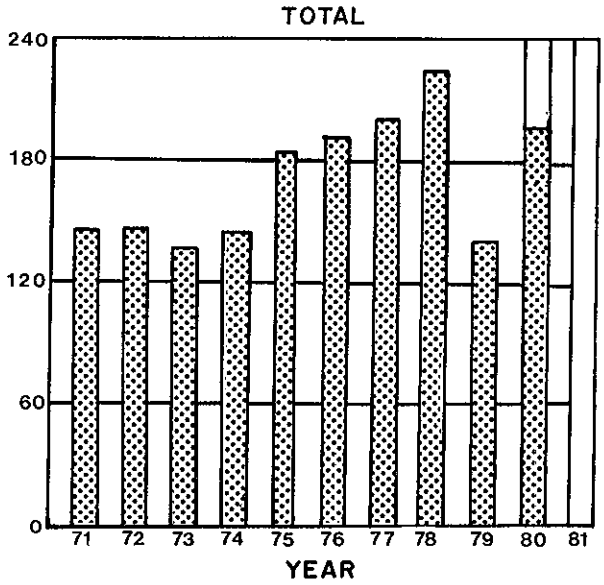


Figure 8a

FIGURE 9 OPENING DAY OF PHEASANT SEASON

FIGURE 10 FISHING NEAR THE UPPER PICNIC AREA

III. REGIONAL ANALYSIS

a. Regional Setting

The Ashuelot River watershed is located in the southwest corner of New Hampshire in Sullivan and Cheshire Counties, with a small section in north-central Massachusetts. The watershed has a generally north-south axis and is diamond-shaped with a length of 42 miles and a width of 17 miles. The watershed's drainage area at the confluence of the Ashuelot and Connecticut Rivers is approximately 421 square miles.

Surry Mountain Lake is located in the middle of Cheshire County, one of the more scenic regions of New England. The geographic character of this area consists of low to high hills with several isolated mountains including Mount Monadnock. Geologic formations are composed of hard crystalline igneous and metamorphic rocks. Outcrops of those configurations can be seen on the slopes and tops of the surrounding mountains and hills.

The topography of the immediate reservoir area is characterized by hilly land with moderate relief. The general vicinity of Surry Mountain Lake is marked by a river valley approximately 2,000 feet wide with comparatively steep walls rising as much as 1,000 feet above the valley's floor. The Ashuelot River has an average slope of 20 feet per mile as it flows through the project area.

The quality of the resources of this region of New Hampshire is an important factor in satisfying the ever growing recreational demand of the southern New England states. The project is readily accessible to all sections of this heavily populated region over an excellent network of state roads and interstate highways, bringing the recreation resources at Surry Mountain Lake within reach of a greatly increasing population.

Population growth trends indicate that the Monadnock region (New Hampshire region 4) will increase by 46 percent, from 73,500 in 1975 to 107,400 in the year 2000. While New Hampshire ranked 42nd among the States in total population in 1975, the population growth rate for New Hampshire is the 11th fastest in the Nation, the highest growth rate of any State in the Northeast. This projected growth indicates the potential for increased recreation demands in southern New Hampshire, and the importance of protecting needed open space in this region.

Economically, the region possessed a flourishing industrial base in the late 19th century, relying on abundant water power and available skilled labor. For many reasons, this industrial economy has now declined, replaced in part by tourism and recreation that emphasize the area's quaint New England countryside and ample year-round recreation facilities. Southwest New Hampshire is also becoming attractive to the second home and retirement home market.

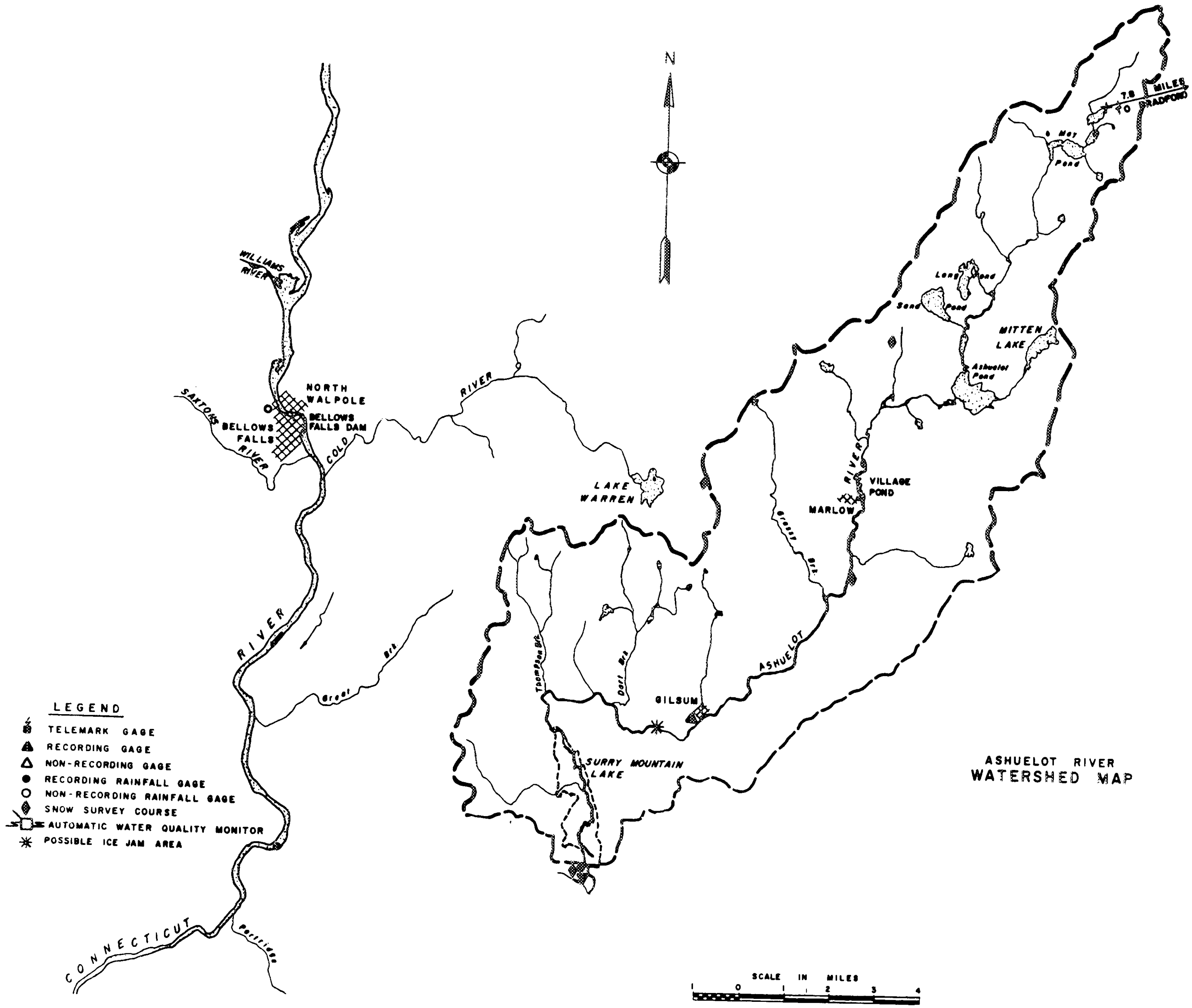
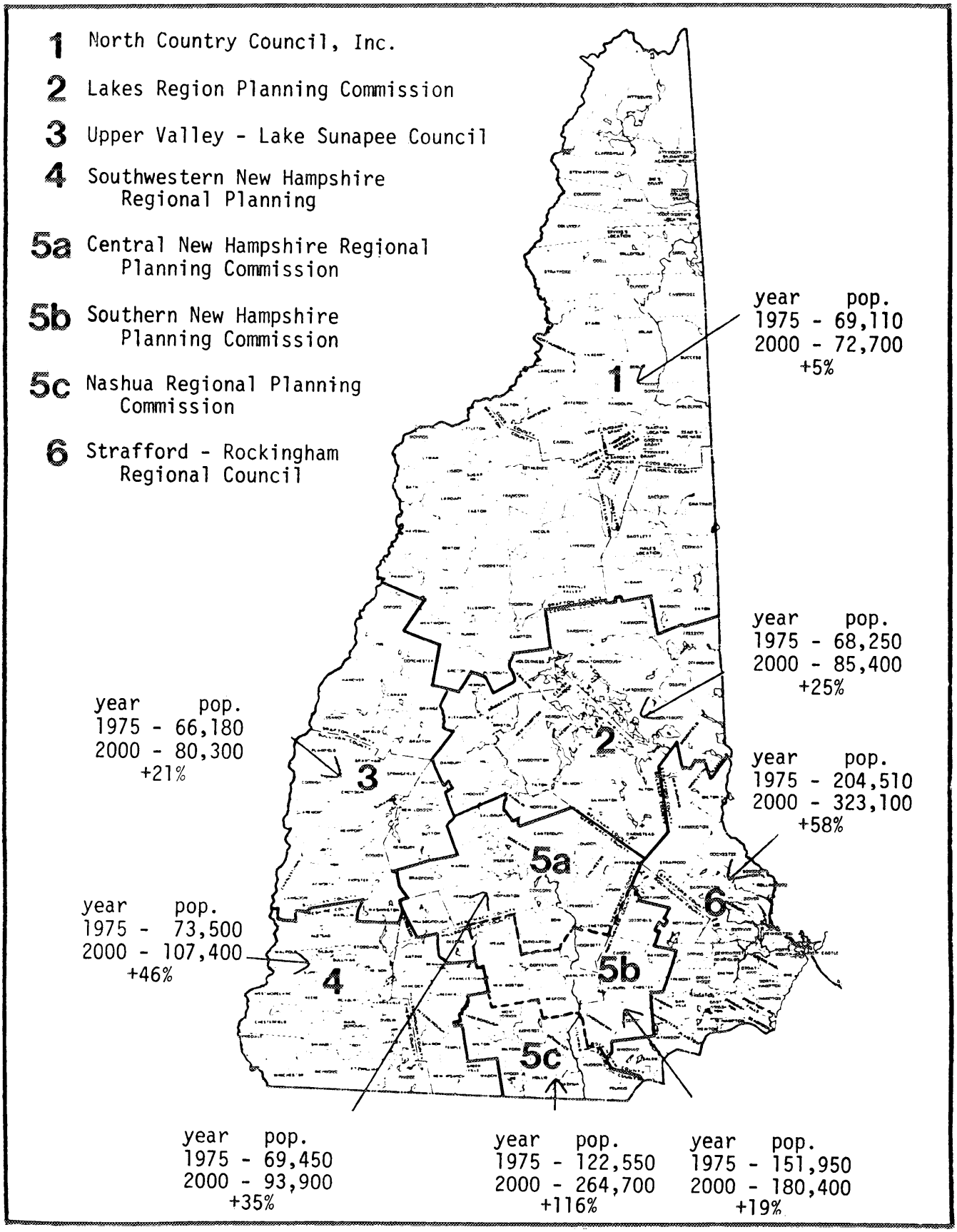

ASHUELOT RIVER
WATERSHED MAP
N
LEGEND
TELEMARK GAGE
RECORDING GAGE
NON-RECORDING GAGE
RECORDING RAINFALL GAGE
NON-RECORDING RAINFALL GAGE
SNOW SURVEY COURSE
AUTOMATIC WATER QUALITY MONITOR
POSSIBLE ICE JAM AREA
SCALE IN MILES
1 0 1 2 3 4
WILLIAMS RIVER
NORTH WALPOLE
BELLOWS FALLS
BELLOWS FALLS DAM
SAXTONS RIVER
COLD RIVER
LAKE WARREN
RIVER
CONNECTICUT
Partridge
Great Brk
MITTEN LAKE
Ashuelot Pond
Long Pond
Sand Pond
Pond
VILLAGE POND
MARLOW
RIVER
Grassy Brk
ASHUELOT
GILSUM
Thompson Brk
Dart Brk
SURRY MOUNTAIN LAKE
7.9 MILES TO BRADFORD

Figure 11

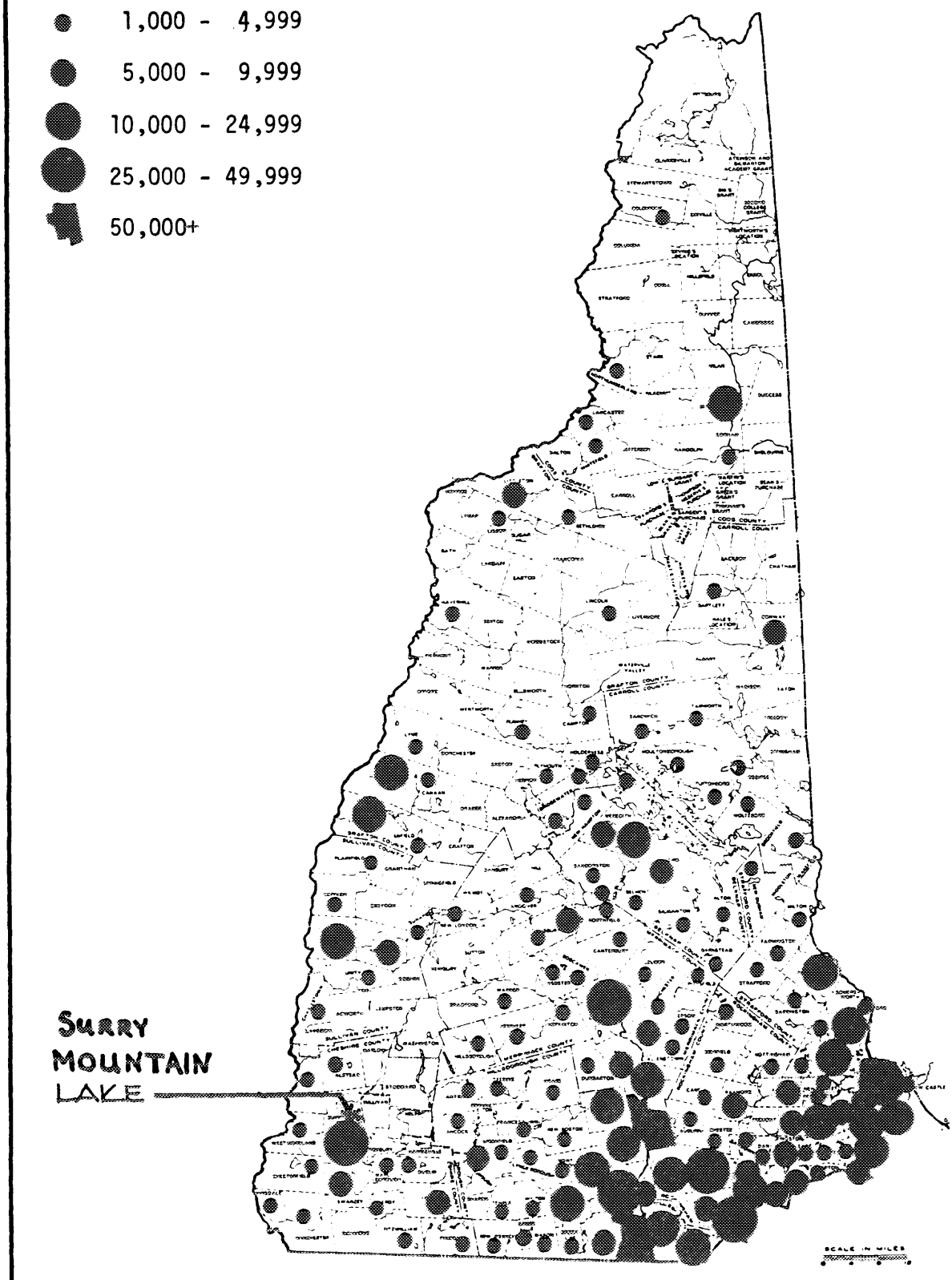
NEW HAMPSHIRE POPULATION GROWTH TO THE YEAR 2000 BY PLANNING REGION



Source: New Hampshire Office of Comprehensive Planning

Figure 12

NEW HAMPSHIRE POPULATION PROJECTIONS TO THE YEAR 2000 BY MUNICIPALITY



Source: New Hampshire Office of Comprehensive Planning

Figure 13

The town of Surry has expressed interest in a bicycle trail and group campground, as well as improvement and expansion of the multiuse trail system, a wildlife observation area north of the lake, parking for hunters off Route 12A and a canoe access area to the Ashuelot River below Surry Mountain Dam.

The city of Keene has proposed a bicycle trail over Surry Mountail Dam to the recreation area, and a group campground on the eastern side of the lake just north of the dam. Coordination of these proposals with the Corps is intended to provide additional recreational opportunities for the local communities of Keene and Surry.

TABLE 2

REGIONAL RECREATIONAL FACILITIES

MAP KEY	AREA	DISTANCE	BOATING	CAMPING	FISHING	HIKING	PICNICKING	SKI-TOURING	SNOWMOBILING	SWIMMING	HUNTING
	FEDERAL										
1	Otter Brook, NH	11	x	-	x	x	x	-	-	x	x
2	Edward MacDowell, NH	22	x	-	x	-	x	-	x	-	x
3	Surry Mt., NH		x	-	x	x	x	-	x	x	x
4	Birch Hill, MA	30	x	x	-	x	x	-	-	x	x
5	Tully Lake, MA	28	x	-	x	-	x	-	-	-	x
6	Vernon Dam Area, VT	29	x	-	x	-	x	-	-	-	x
	TOTAL		6	1	5	3	6	0	2	3	6
	STATE PARKS										
7	Monadnock St. Pk, NH	23	-	x	-	x	x	-	-	-	-
8	Rhododendron SP, NH	19	-	-	-	x	x	-	-	-	-
9	Pisgah SP, NH	21	-	-	-	-	-	-	x	-	-
10	Otter Brook SP, NH	11	-	-	x	x	-	-	-	-	-
11	Pillsbury SP, NH	26	x	x	x	x	x	-	-	-	-
12	Greenfield SP, NH	23	x	x	x	-	x	-	-	x	-
13	Miller SP, NH	29	-	-	-	x	x	-	-	-	-
14	Chesterfield Gorge SP, NH	8	-	-	-	-	x	-	-	-	-
15	Lake Dennison SP, MA	30	-	x	x	x	x	x	-	x	x
16	Fort Dummer, SP, VT	24	-	x	-	x	x	-	-	-	-
	TOTAL		2	5	4	7	8	1	1	2	1
	STATE FORESTS										
17	Honey Brook SF, NH	19	-	-	-	-	-	-	-	-	x
18	Fox SF, NH	28	-	-	-	x	-	-	-	-	-
19	Annet SF, NH	29	-	-	x	-	-	-	-	-	x
20	Casalis SF, NH	30	-	-	-	-	-	-	-	-	x
21	Leighton SF, NH	15	-	-	-	-	-	-	-	-	x
22	Wantastignet SF, NH	19	-	-	-	x	-	-	-	-	x
23	Otter River SF, MA	29	-	x	x	-	x	-	-	x	x
24	Mt. Grace SF, MA	24	-	-	x	x	x	-	-	-	x
25	Warwick SF, MA	24	-	-	x	x	x	-	-	-	-
26	J.T. Dosand SF, VT	17	-	-	-	-	-	-	-	-	x
	TOTAL		0	1	4	4	3	0	0	1	8

TABLE 2 (Cont'd)

REGIONAL RECREATIONAL FACILITIES

MAP KEY	AREA	DISTANCE	BOATING	CAMPING	FISHING	HIKING	PICNICKING	SKI-TOURING	SNOWMOBILING	SWIMMING	HUNTING
	OTHER STATE AREAS										
27	Bald Hill Wildlife Mgt (NHFG)	23	-	-	-	-	-	-	-	-	x
28	Fox Forest (DRED)	28	-	-	-	x	-	-	-	-	-
29	Contoocook River (NHFG)	27	-	-	x	-	-	-	-	-	-
30	Beaver Brook Canyon	9	-	-	x	-	-	-	-	-	-
31	Mill Brook Fishing Access, Vernon, VT	25	x	-	x	-	-	-	-	-	-
32	Vern Hatchery Pond Access Area, VT	27	-	-	x	-	-	-	-	-	-
33	Connecticut River Fishery access, VT	26	x	-	x	-	-	-	-	-	-
34	Roaring Brook Wildlife Management Area	25	-	-	-	x	x	-	-	-	-
	TOTAL		2	0	5	2	1	0	0	0	1
	TOWN AREA*										
35	Warren Lake Public Landing (Alsted)	14	x	-	-	-	-	-	-	-	-
36	Shedd Brook Park (Hillsborough)	29	-	-	-	-	x	-	-	x	-
37	Monahan Park (Hillsborough)	26	-	-	-	-	x	-	-	x	-
38	Town Beach (Antrim)	28	x	-	-	-	x	-	-	x	-
39	Town Beach (Bennington)	30	-	-	-	-	-	-	-	x	-
40	Pierces Island Park (Chesterfield)	13	-	-	-	x	-	-	-	-	-
41	Town Beach, Sunset Lake (Greenfield)	28	-	-	-	-	x	-	-	x	-
42	Town Beach, Zephyr Lake (Greenfield)	29	-	-	-	-	-	-	-	x	-
43	Town Beach, Hancock	24	x	-	-	-	-	-	-	x	-
44	Shattuck Park (Jaffrey)	26	-	-	x	x	-	-	-	-	x
45	Contocook Lake Beach (Jaffrey)	23	-	-	-	-	-	-	-	-	x
46	Dummer Hill (Keene)	4	-	-	x	x	-	-	x	-	-
47	Lakies Wildwood Park (Keene)	6	-	-	-	x	-	-	-	-	-
48	Wheelock Park (Keene)	5	-	-	-	-	x	-	x	-	-
49	Ashelot Park (Keene)	6	-	-	-	-	x	-	-	-	-
50	Robin Hood Park (Keene)	8	-	-	-	x	x	-	x	-	-
51	Public Landing (Nelson)	17	x	-	-	-	-	-	-	-	-

*All Town Areas are located in New Hampshire unless otherwise noted.

TABLE 2 (Cont'd)

REGIONAL RECREATIONAL FACILITIES

MAP KEY	AREA	DISTANCE	BOATING	CAMPING	FISHING	HIKING	PICNICKING	SKI-TOURING	SNOWMOBILING	SWIMMING	HUNTING
	TOWN AREA (CON'T)*										
52	Teixeira Park (Peterborough)	26	-	-	-	-	x	-	-	-	-
53	Putnam Park (Peterborough)	27	-	-	-	-	x	-	-	-	-
54	Cunningham Pond (Peterborough)	27	-	-	-	-	-	-	-	x	-
55	Richmond Town Beach	28	-	-	x	-	x	-	-	x	-
56	Public Landing (Stoddard)	17	x	-	-	-	x	-	-	-	-
57	Sullivan Town Farm (Sullivan)	16	x	-	-	x	x	-	-	-	-
58	Wright Grove (Surry)	1	-	-	-	-	x	-	-	-	-
59	Wilson Pond (Swanzey)	12	x	-	-	-	-	-	-	x	-
60	Richardson Park (Swanzey)	14	-	-	-	-	x	-	-	x	-
61	Winchester Town Beach	15	-	-	-	-	x	-	-	x	-
62	Herricks Cove - Connecticut River (Rockingham, VT)	19	x	-	-	x	x	-	-	-	-
63	Bellows Falls Playground (Rockingham, VT)	11	-	-	-	-	x	-	-	x	-
64	Saxtons River Recreation Area (Rockingham, VT)	13	-	-	-	-	x	-	-	x	-
65	Davenport/Aikenlands (Westminster, VT)	15	-	x	-	x	-	-	-	-	x
66	Prospect Hill (Drumerston, VT)	26	-	-	-	x	-	-	-	-	-
67	Living Memorial Park (Brattleboro, VT)	26	-	-	-	-	x	x	-	x	-
	TOTAL		8	1	3	9	19	1	3	15	3

*All Town Areas are located in New Hampshire unless otherwise noted.

SURRY
MOUNTAIN LAKE
Surry, New Hampshire

GREEN MOUNTAIN NATIONAL FOREST

KEENE

To Concord 6 mi

To Manchester 8 mi

VT

MASS

NH

MASS

REGIONAL RECREATIONAL FACILITIES

- Federal Areas
- State Parks
- State Forests
- Other State Areas
- Town Facilities
- 15 Mile Driving Radius
- 30 Mile Driving Radius

Scale in mile

3 2 1 0 3 6

N

Figure 14

IV. RESOURCES OF THE PROJECT AREA

a. Natural and Scenic Qualities

The project area, like much of the Monadnock region of southwest New Hampshire, is an attractive vacation area because of its scenic values, moderate summer temperatures and proximity to the heavily populated regions of southern New England. The peak time of scenic splendor for this area is during the fall foliage season in early October.

b. Ecological Features

The Surry Mountain Lake project area covers a total of 1,781 acres, of which 1,695 acres are owned in fee with 86 acres in flowage easement. Approximately 57 percent of the reservoir is forested, with mixed hard and soft woods, characteristic of the upland areas of southern New Hampshire, comprising the forests. The principal softwoods include white pine and hemlock; the principal hardwoods are northern red oak, black oak and hickory. Yellow birch, beech, sugar maple and black cherry are found in the higher elevations, and elm, black oak, red maple, alder and aspen are found along the river.

The slopes of Surry Mountain, which form the entire eastern part of the project area, are wooded, while stands of conifers and open fields are found on the western side of the lake. At the northern end of the lake is a sizable area of open marsh with many grassy areas interspersed with coves and inlets. The vegetation cover along the flood plain of the Ashuelot River consists of scattered trees, brush and grasses which have adapted to low wet areas. Most of the fields and open areas located at the northern end of the project are leased to farmers for pasture and hay; however, some of those not being used for agricultural purposes are reverting back to brush and woodland.

c. Cultural Resources

The prehistoric inhabitants of this region probably used the portion of the Ashuelot Valley which includes Surry Mountain Lake as a transportation route from the Connecticut Valley for trade or to reach hunting areas in the uplands. They may also have camped in the vicinity to mine outcrops of quartz for toolmaking. In the 17th and 18th centuries, the Indians may also have mined pockets of lead to make bullets. Raiding parties passed through the valley during the French and Indian War, but few Indians appear to have visited the area after the town of Surry was settled.

Archaeological sites resulting from the above activities would probably be small campsites, each occupied only for a few days or a season. An archaeological reconnaissance of Surry Mountain Lake, undertaken in the summer of 1979, found no prehistoric sites in the property but indicated that sites in the area are most likely to be on higher ground bordering the government property bounds.

SURRY MOUNTAIN LAKE

SURRY, NEW HAMPSHIRE

SOILS

SYMBOL	NAME
1	ONDAWA LOAMY FINE SAND
4	ONDAWA FINE SANDY LOAM, HIGH-BOTTOM
5	RUMNEY FINE SANDY LOAM
6	SACO SILT LOAM OVER SAND OR GRAVEL
7	MIXED ALLUVIAL LAND
10	MERRIMAC FINE SANDY LOAM
12	HINCKLEY LOAMY SAND
14	SUDBURY FINE SANDY LOAM
26	WINDSON LOAMY SAND
43	GLOUCESTER EXTREMELY STONY SANDY LOAM
60	GLOUCESTER STONY SANDY LOAM
61	HOLLIS-CHARLTON VERY ROCKY LOAM
63	CHARLTON VERY STONY LOAM
66	PAXTON LOAM
67	PAXTON VERY STONY LOAM
69	SUTTON VERY STONY LOAM
132	MERRIMAC LOAMY SAND
197	FRESH WATER MARSH
298	PODUNK-RUMMEY FINE
299	MADE LAND
313	DEERFIELD LOAMY SAND
514	WALPOLE FINE SANDY LOAM
526	MERRIMAC GRAVELLY FINE SANDY LOAM
547	LEICESTER VERY STONY LOAM
612	HINCKLEY GRAVELLY LOAM
IH	ONDAWA FINE SANDY LOAM

SLOPE CLASSIFCATION

A	0 - 3%
B	4 - 8%
C	9 - 15%
D	16 - 25%
E	26 - 35%

SCALE IN FEET

100 300 500 1500

0 200 400 1000

north

FIGURE 15

SURRY MOUNTAIN LAKE

SURRY, NEW HAMPSHIRE

SEPTIC SUITABILITY LIMITATIONS

- SLIGHT
- MODERATE
- SERVERE

SCALE IN FEET
100 300 500 1500
0 200 400 1000

north

FIGURE 16

SURRY MOUNTAIN LAKE

SURRY, NEW HAMPSHIRE

TRAIL SUITABILITY LIMITATIONS

- SLIGHT
- MODERATE
- SERVERE

SCALE IN FEET
100 300 500 1500
0 200 400 1000

north

FIGURE 17

European-Americans first settled in Surry during the 1760's, and the town was incorporated in 1769. Farms were dispersed in locations throughout the town. With the opening of the old Cheshire Turnpike in 1805 and subsequent development of Surry center, several taverns and a variety of shops and stores were opened nearby. Most of these establishments closed by the time of the Civil War and many upland farms were abandoned as their owners moved to the Midwest or the industrial centers of southern New England.

When Surry Mountain Dam was completed in 1942 the remaining structures within government property bounds were moved or demolished, and much of the old Cheshire Turnpike was abandoned. The archaeological reconnaissance of the project area located the remains of farm sites within government property. Some of these also served as taverns, stores, or craftsmen's shops at some time. An early 20th century mica mine was also found near the base of Surry Mountain, and several abandoned roads were traced throughout the property. These historic sites constitute an important resource through their role in the town's history and their potential for scientific study to learn more about early settlement and land use in rural New England.

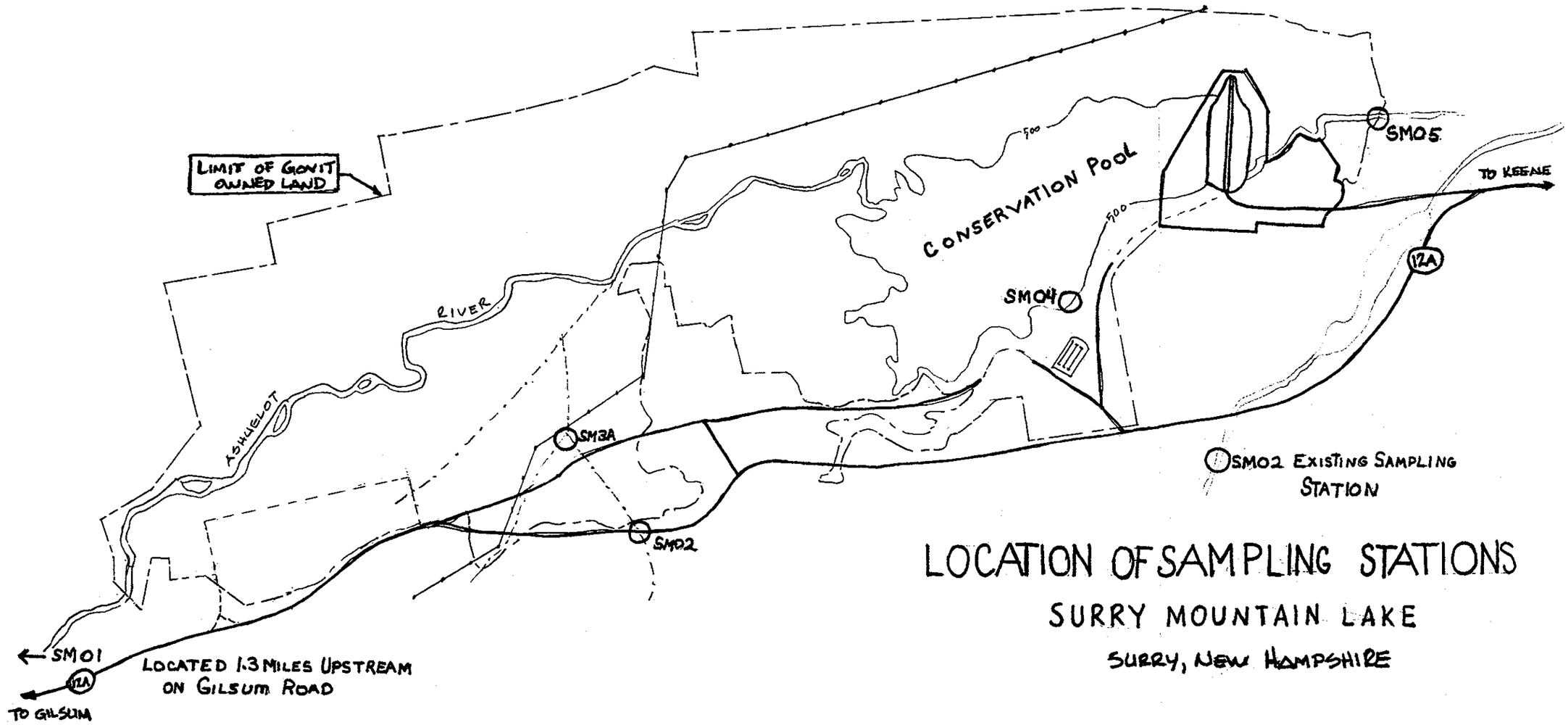
These 18th and 19th century farms, shops, taverns, and other structures within Surry Mountain Lake are best left in their present overgrown condition, to preserve their potential for scientific study and discourage vandalism. Plans for recreational development such as trails, camping or picnicking facilities should avoid the locations of historic features, and improvements which involve excavation and construction activity should be accompanied by appropriate archaeological studies. Coordination with the Historic Sites Section of the New Hampshire Department of Resources and Economic Development will be maintained to ensure preservation of the historic resources at Surry Mountain Lake.

d. Relocations

When Surry Mountain Dam was constructed, the Connecticut River Power Company power line, New Hampshire Route 12A and several homes located along Route 12A were relocated. The power line alignment was shifted to the east to avoid crossing the lake, and Route 12A was moved to the west out of the reservoir area. Part of the old Route 12A is now used for access between the dam, recreation area and Surry Village.

e. Water Quality

The waters of the Ashuelot River and its tributaries upstream of Surry Mountain Dam and immediately downstream are rated Class B by the New Hampshire Water Supply and Pollution Control Commission (NHWSPCC). Class B waters are suitable for bathing and recreation, fish habitat and, after adequate treatment, water supplies. There can be no disposal of sewage or waste into Class B waters except those wastes that have received adequate treatment to prevent the lowering of the physical, chemical and bacteriological characteristics of the water. Class B waters have no objectionable physical characteristics, have pH levels between 6.5 and 8.0 or as naturally occurs, and contain not more than 240 coliform bacteria per 100 milliliters. Surry Mountain Lake has been classified as a warm



LOCATION OF SAMPLING STATIONS

SURRY MOUNTAIN LAKE

SURRY, NEW HAMPSHIRE

FIGURE 18

water fishery by the New Hampshire Fish and Game Department, and as such, turbidity levels cannot exceed 25 standard units, while D.O. levels must be no less than 5.0 mg/1.

The New England Division has monitored the quality of water in the Ashuelot River in the vicinity of Surry Mountain Lake by sampling on a periodic basis since 1970. Locations of the sampling stations are shown on the following map. A wide range of parameters have been measured at these stations, which makes possible an evaluation of the physicochemical and bacteriological conditions of the impoundment, its tributaries and its discharge.

Overall, the existing water quality conditions monitored at sampling stations meet the NHWSPCC Water Quality Standards for Class B waters with the following exceptions:

1. Periodic exceedance of coliform bacteria levels during warm summer days. From analysis of the results, it appears that livestock grazing in the upstream watershed may have contributed a portion of the excessive coliform bacteria levels in the streams feeding into the lake, while bathers within the recreational beach area increased the coliform content within the lake itself. These conditions have caused the swimming beach to be closed at times in the past.

2. A few occurrences of dissolved oxygen falling below the minimum allowable concentration of 5.0 mg/1. The average dissolved oxygen content in all sites measured was above 8.3 mg/1. The lowest dissolved oxygen content occurred within the impoundment area where, as expected, bacterial decomposition of organic matter would generally lower the oxygen level.

3. Many instances of pH measurements falling slightly below the 6.5 unit lower limit established by the NHWSPCC. It appears that this may be a naturally occurring condition since there are no major wastewater discharges upstream of the project area. Levels of pH generally averaged around 6.3 standard units.

4. Many instances of relatively high concentrations of iron, manganese and zinc. Iron and manganese have levels in the water that are not harmful to aquatic life, but are higher than limits established for drinking water standards. These levels may be attributed to the low pH of the stream and river since iron and manganese are more easily leached from the soil under these conditions. The zinc levels have exceeded EPA standards for protection of aquatic life on a number of occasions. Mitigating circumstances surrounding the effect of the high zinc levels are unknown at this time, but it appears that they may exist since there have been no known harmful effects on the aquatic life in the river or lake.

5. Total phosphate levels in almost all instances in excess of the 0.015 mg/1 concentration, which is the reported minimum threshold level necessary to produce algae blooms. Nitrate levels are also above those necessary to produce an algae bloom. However, it appears from the data, as well as from observation, that there has not been any occurrence of a major algae bloom. Analysis of the phosphate and nitrate levels in the inflow and discharge show little change, thus indicating no uptake is occurring within the lake.

6. Color and turbidity in excess of the standards established by the NHWSPCC only on rare occasions. Turbidity levels tended to increase in the inflow, outflow and in the lake at approximately the same time, thus indicating a recent storm. Color levels were exceeded only in the outflow.

It should be noted that New Hampshire waters are normally deemed suitable for cold water fisheries, and should not exceed 10 standard units for turbidity nor have less than 6 milligrams/liter (mg/l) of oxygen unless naturally occurring. In the case of Surry Mountain Lake, however, the lake was classified as a warm water fishery following the failure to a trial trout stocking program. The New Hampshire Fish and Game Department had initiated the program which was later abandoned when it was determined that the lake did not meet the requirements for salmonid management. The failure may have stemmed from the relatively high summer temperatures (frequently above 70°F) which occur in the impoundment.

The waters of Surry Mountain Lake on occasion do not meet the Class B standards as established by NHWSPCC for dissolved oxygen, pH and total coliform bacteria. Certain metals are present at relatively high levels (iron, manganese and zinc) but do not appear to be harmful for the uses which the waters of the Ashuelot River and Surry Mountain Lake are intended. Of the parameters that are exceeded, the total coliform parameter appears to be the most important to the Corps' interests, since high coliform levels can force the closing of the beach to swimming.

Other uses of the lake such as boating, fishing and water skiing management should not be adversely affected by any of the parameters exhibiting high levels.

f. Borrow Areas

All of the former borrow areas at Surry Mountain Lake have been graded and naturally revegetated since completion of construction. A small portion of one borrow area near Surry Village is still used occasionally for project maintenance purposes. Another borrow area southeast of the dam is now used as a pistol range by the Keene Police Department and the New Hampshire Fish and Game Department. A third borrow area northwest of the dam has been used for disposal of spoil and rock and also serves as an overflow for campers from the adjacent private campground.

g. Adjacent Land Use

The Surry Mountain Lake project area is bordered on the east by Surry Mountain, and on the west by Route 12A. Located between 12A and the project area are the majority of the homes of the town's 362 people.

Overnight camping is available to the public at the Surry Mountain Camping Area, which is located on private land about 800 feet south of the Surry Mountain day-use area. The campground is privately developed and operated and has about 30 campsites on approximately 10 acres of land.

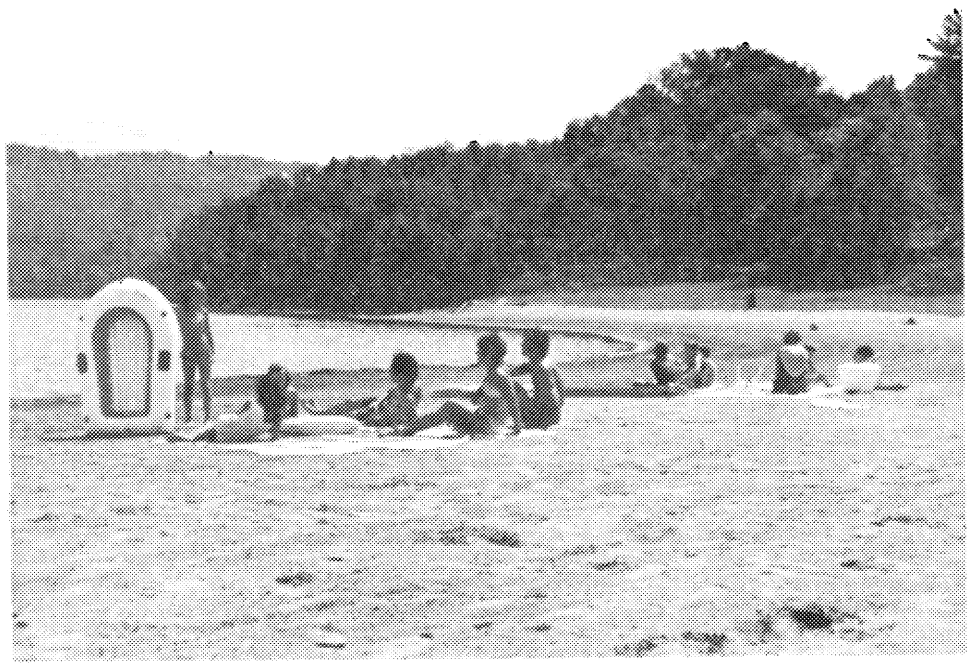


FIGURE 19 BEACH AREA AT THE CONSERVATION POOL

FIGURE 20 SURRY'S LARGE PLAYING FIELD AND CHANGE FACILITIES

V. RESOURCE USE OBJECTIVES

In order to best serve the needs of the public while also enhancing and protecting the project resources at Surry Mountain Lake, the following resource use objectives have been developed:

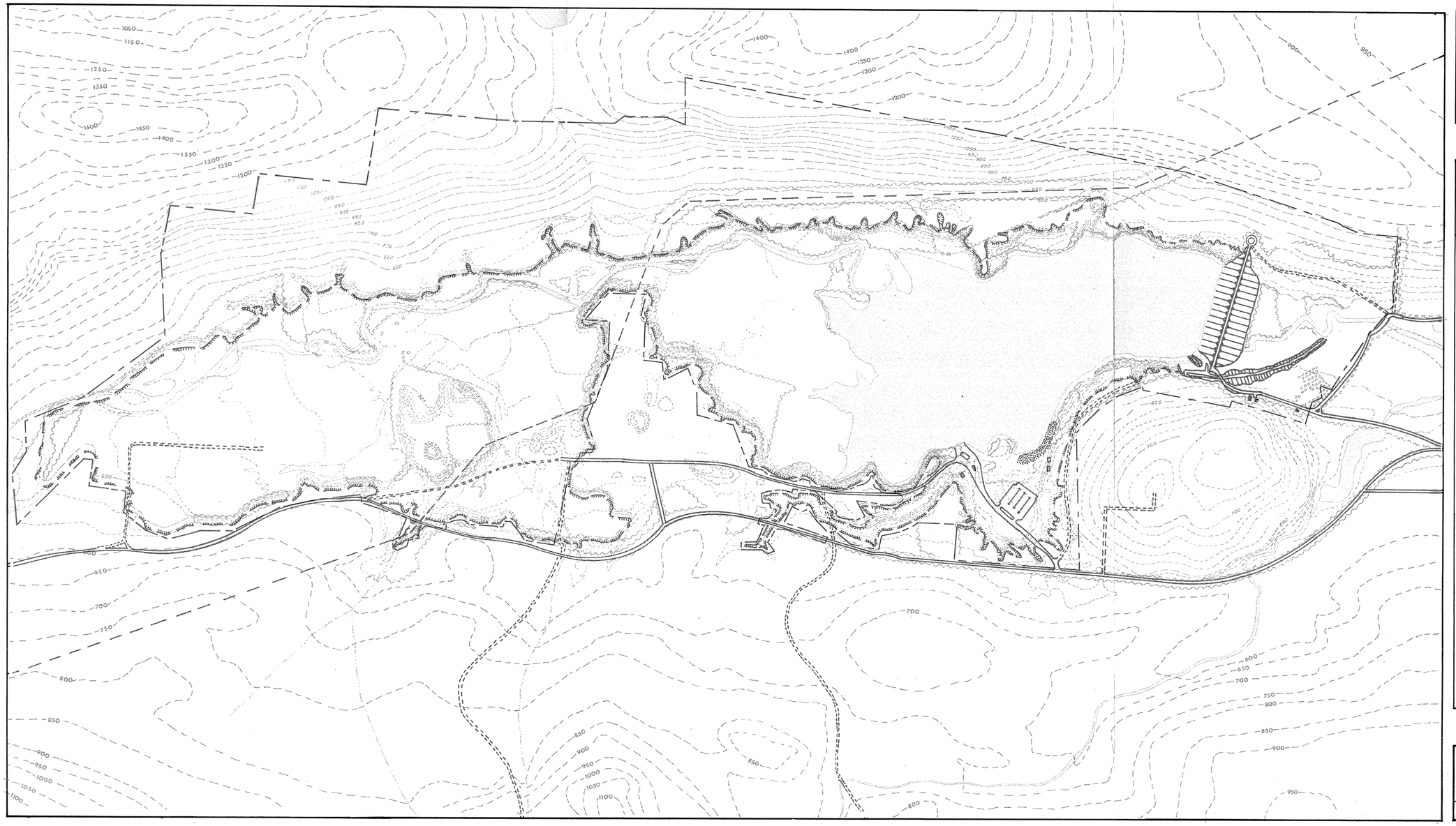
1. Provide a high quality day-use area with a variety of recreation opportunities including swimming, sunbathing, water skiing, picnicking, play areas, open space, power and nonpower boating. The Surry Mountain Lake Recreation Area offers a variety of day-use opportunities and facilities capable of accommodating nearly 4,000 people a day. Together with similar day-use facilities at Otter Brook Lake in Keene, this area provides important local recreation opportunities, especially since the town of Surry and the city of Keene are within bikeriding distance of the projects. Excellent access over State Routes 9, 10, 12, and 12A also makes the area readily accessible from throughout Cheshire County. While it is not possible to significantly expand the beach and picnic areas, some improvements to existing facilities are planned in order to upgrade the already very well maintained facilities and grounds.

2. Continue the present wildlife conservation and management program under the direction of the New Hampshire Fish and Game Department in order to protect valuable wildlife habitat and provide public hunting, fishing and trapping opportunities. An excellent way of obtaining optimum use of public land is by multiple-purpose resource management. The Surry Mountain Lake project area contains a diverse assortment of vegetation and habitat types which supports a variety of native wildlife including wild turkey and cottontail rabbits. In addition, pheasants are stocked by the State in the fall on a "put and take" basis. Maintenance of this ecologically diversified area will complement the developed recreation facilities and enhance passive uses while preserving most of the reservoir in its natural state.

3. Expand and improve the multiuse trail system. At present, there are designated snowmobile trails and areas, and a hiking/nature trail has recently been established near the day-use area adjacent to the main access road. Surry Mountain, which rises 600 feet above the lake to the east, offers great potential for a wilderness hiking/cross country ski trail and is being considered for future development to tie in with existing trails to form a loop system. In addition, proposals have been made to establish a bike path from former Route 12A over the dam to the day-use recreation area. This would require crossing the upstream face of the dam for a short distance near the spillway, but would also provide a suitable and much needed access road for project maintenance and management purposes. The bike path would also serve a dual capacity as a snowmobile trail during the winter.

4. Continue to provide land for agricultural use to local farmers. In addition to the agricultural benefits, this effort also preserves open space and provides a variety of habitat for many wildlife species. At present, standing corn on leased agricultural land supports a large number of wild turkeys which come down from Surry Mountain during the winter months.

5. Establish a small, informal group camping area northeast of the dam on the side of Surry Mountain overlooking the lake. This proposal by local interests in Keene would provide excellent camping opportunities for organized groups, with access trails to the camp site tying in with the proposed multiuse trail system around the lake.



SURRY MOUNTAIN LAKE

SURRY, NEW HAMPSHIRE

PROJECT AREA

PROJECT BOUNDRY

CONTOUR INTERVAL 50 FEET

550 FT FLOW ELEVATION

SCALE IN FEET

100 300 500 1500

0 200 400 1000

north

FIGURE 21

VI. PHYSICAL PLAN OF DEVELOPMENT

a. Designation of Resource Use

1. Recreation Sites. All project lands within the Surry Mountain Lake project area are available to the public for general recreational use with the exception of a small area retained by the Corps of Engineers for operation and maintenance around the dam and spillway. In order to provide a framework for development and management of the reservoir, project lands have been designated for various uses according to the following land use categories.

Project Operations

Lands which are required for essential activities of the operation and maintenance of Surry Mountain Dam and appurtenant structures such as the spillway, intake and outlet tunnel, Project Manager's office, home and surrounding area are designated under the project operations land use category. This amounts to approximately 80 acres, which also includes two picnic tables and a fireplace at the visitor overlook area at the east end of the dam.

Operations-Intensive Recreation

Existing recreation sites at the 90-acre Surry Mountain Day-Use Area include three picnic areas, a beach and a boat launching area. There are a total of 74 picnic tables, 37 fireplaces and 25 trash barrels. Drinking water from four bubblers is supplied from a well, and there is parking for 400 automobiles. Sanitary facilities consist of a restroom at the northern end of the recreation area and a restroom and change house at the beach. Most of the tables are located at the picnic areas, however several are placed along the beach.

Operations-Low Intensity Recreation

Most of the land area at Surry Mountain Lake is undeveloped and available for a variety of recreational activities including hunting, hiking, snowmobiling, cross country skiing, nature study, horseback riding, and bicycling. Approximately 130 acres of land within the reservoir area are leased to local farmers for agricultural or other purposes and also provides good habitat for wildlife, as do most all of the undeveloped project lands. Overall, there are 1,233 acres of open and wooded land which provide numerous opportunities for passive recreation throughout the year.

Surry Mountain Lake comprises 1,695 acres of fee-owned land which break down as follows:

Designation	Acreage	Cover	Elev. (ft. NGVD)	Terrain
Reserved for Project Operations (project structures)	80	Open	475-600	-
Permanent Lake	265	Water	500	-
River	20	Water	500-550	-
Surry Mountain Day-Use Area	90	Open-Wooded	500-565	Rolling
Fish & Game Management Areas	1103	Wooded	500-1200	Rolling to Steep & Rugged
Agricultural Areas	137	Open	515-550	Flat to Rolling

2. Fish and Wildlife Conservation and Management

Surry Mountain Lake is classified as a warm-water fishery and contains populations of horned pout, chain pickerel, largemouth bass and yellow perch. The Ashuelot River is annually stocked with brown, rainbow and occasionally brook trout by the New Hampshire Fish and Game Department. While most fishing pressure occurs during the summer, there is some ice fishing during the winter months. Game animals and birds found in the project area include squirrel, snowshoe hare, woodcock, grouse, whitetailed deer, turkeys and cottontail rabbits. Pheasants are stocked during the fall hunting season. Other birds and animals frequently seen include great blue heron, kingfisher and porcupine along with fur-bearing species including fisher, mink, raccoon, red fox, beaver, muskrat, and an occasional coyote and bobcat. There is some trapping activity in the area for beaver, muskrat and mink, with trapping permits available from the project manager.

Avian predators present in the project area include an occasional golden eagle, osprey, Peregrine Falcon, chicken hawk, snowy owl (winter only), and pigeon hawk. Broad-winged hawks, greathorned, screech and barn owls are also frequently seen in the vicinity.

The lake provides approximately 50-100 acres of good quality waterfowl habitat, however, the production potential of the marsh at the northern end of the lake is limited due to water-level fluctuations during the spring nesting season. The area is popular with duck hunters in the fall.

FIGURE 22 LEASED AGRICULTURAL LAND, SURRY MOUNTAIN

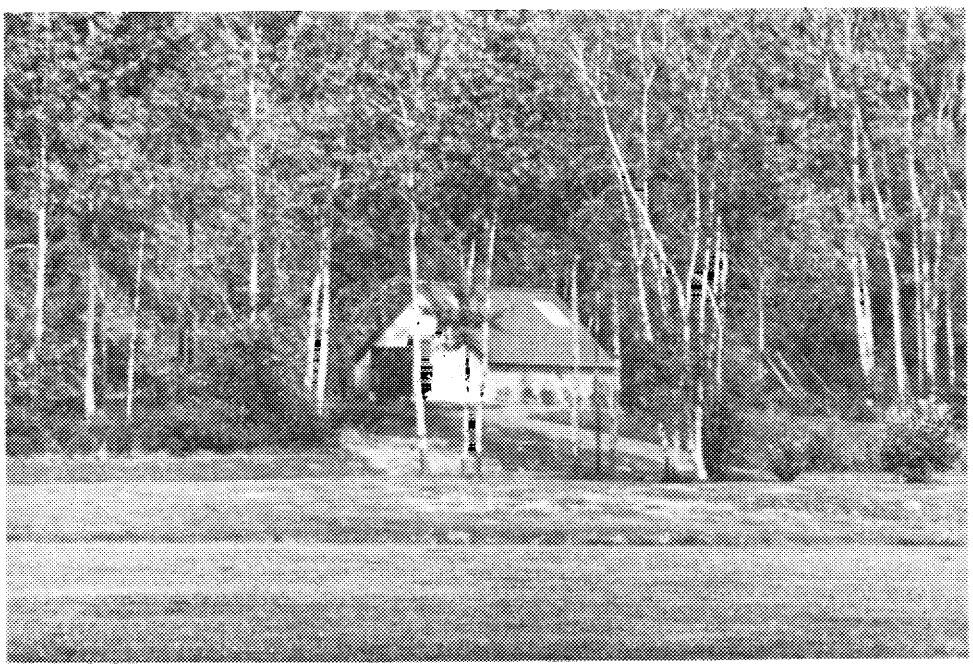


FIGURE 23 RESTROOM FACILITIES WITH HANDICAP ACCESS

The New Hampshire Fish and Game Department conducts three very important wildlife management programs at Surry Mountain Lake. The reservoir area is the major pheasant stocking site in southwestern New Hampshire. Up to 1,000 birds have been stocked during the October pheasant hunting season in the past, but due to the cost of purchasing pheasants and the $4.00 pheasant stamp required in addition to a New Hampshire hunting license there has been a significant decrease in stocking throughout the state in recent years. The project area is important, however, because there still remains ample field land in a sizable area in public ownership with less chance of private landowner conflict during the season.

Since wild turkeys were originally released in nearby Walpole, New Hampshire in 1975, they have expanded into other towns in Cheshire County and are among the most populous in the town of Surry. Especially attractive to them is the 3/4-mile ridge of Surry Mountain, undisturbed by roads and human development and having good numbers of mast-producing hardwoods. The fields above the lake make good brood habitat for young turkeys during the summer. Some of the fields are planted to corn which is purposely left standing for the use of the turkeys during the winter. This is an extremely valuable management tool because food availability above the deep snow in January and February is a major limiting factor. In 1979, eleven turkeys were trapped in the cornfields north of the lake and transplanted to start similar populations in other parts of New Hampshire.

Management techniques to improve the habitat and increase the population of the New England Cottontail Rabbits on a 20-acre tract in the upper part of the reservoir area have been coordinated by the New Hampshire Fish and Game Department with Corps of Engineers Rangers. Since this is the "rarer" of the two cottontail species which has disappeared from most of New Hampshire and New England, it is important that measures be taken to manage this population, especially since this area is one of the few places where cottontails exist on public land. Plans are therefore being considered to make this a demonstration area for habitat management.

3. Agricultural and Other Uses

A total of 105.5 acres of reservoir land is leased to five local farmers for various agricultural purposes. In addition, 5 acres are leased to the Surry Mountain 4-H Club for horse shows, 4 acres are leased to the Surry Mountain Camping Area adjacent to the Corps recreation area, 2.75 acres are leased to the city of Keene for use as a pistol range by the Police Department and 16.3 acres are leased to the State of New Hampshire for highways.

b. Project Structures

The project administration area at Surry Mountain Lake is immediately below the dam and spillway on the access road to the dam. The Project Manager's office, garage, utility building and home are located here. An overlook area is provided for the public on top of the dam next to the gate house and adjacent to the spillway, and a turnaround is provided at the other end of the dam at the flagpole along with two picnic sites.

c. Site Analysis and Planning

The entire project area at Surry Mountain Lake has been evaluated for potential recreational use and future development, consistent with local and regional desires and needs. In addition to the existing day-use beach, boat launching ramp, picnic areas and informal multiuse trails, future development potential includes a group campground, a bicycle path and expansion of the present trail system to serve hikers, snowmobilers and cross country skiers.

The present day-use recreation area consists of a 150-foot-wide, 800-foot-long cresent shaped beach; 74 picnic sites with 37 fireplaces; 4 drinking water fountains; 2 rest rooms with flush toilets; a short nature/interpretive trail; a dual lane concrete plank boat launching ramp and parking for 400 cars. This area is already developed to its fullest potential and is not capable of further expansion. However, some minor improvements could be made such as: the addition of two horseshoe pits and a removable picnic shelter near the point picnic area. The horseshoe pits would enhance the other recreational opportunities available and provide an activity for less athletically active visitors. The picnic shelter would offer some shade and protection near the lake, and, if mobile, would not be subject to damage from flood control operations.

A future bicycle trail between the recreation area and the access road to the dam is proposed to follow a new project maintenance road over the dam and around the intake channel near the spillway. This road will angle down the northwest face of the dam and provide much more convenient access from the Project Manager's headquarters, over the dam, to the former Route 12A and the recreation area. Bicyclists would also now be able to ride from Keene to the project on lightly used country roads instead of Route 12A, which should prove to be safer and shorter as well as more scenic. This road could also be used by snowmobiles, cross country skiers and hikers, and serve as an important link in the overall trail system. Construction of the maintenance road/bicycle path could be accomplished with operation and maintenance funds.

The present trail system at Surry Mountain Lake consists of a short nature/interpretive trail at the recreation area, and informal use of the power line and roads through the reservoir area by snowmobilers and occasional hikers, cross country skiers or bicyclists. The potential for significantly enhancing available trail opportunities is great. A 7-mile-long multiuse loop trail with connecting spurs is proposed to start at the dam, connect with the powerline and continue north along the western slope of Surry Mountain, cross the Ashuelot River at the upper end of the reservoir, connect with the Dort Road, continue south to the recreation area and return to the dam. Most of this trail is already usable, with the principal missing links being the previously discussed connection over the western end of the dam around the intake channel where a maintenance road/bicycle path is proposed, and a bridge over the river near the Dort Road. Construction of the bridge is also a likely possibility for a training project for an engineering unit of the Army Reserves or the National Guard. This trail would provide excellent opportun-

SURRY MOUNTAIN LAKE

SURRY, NEW HAMPSHIRE

LAND USE ALLOCATION PLAN

- PROJECT BOUNDRY
- OPERATIONS
- FISH AND WILDLIFE
- LOW INTENSITY
- INTENSIVE RECREATION
- LEASED LAND
- PROJECT OPERATION

SCALE IN FEET
100 300 500 1500
0 200 400 1000

north

FIGURE 24

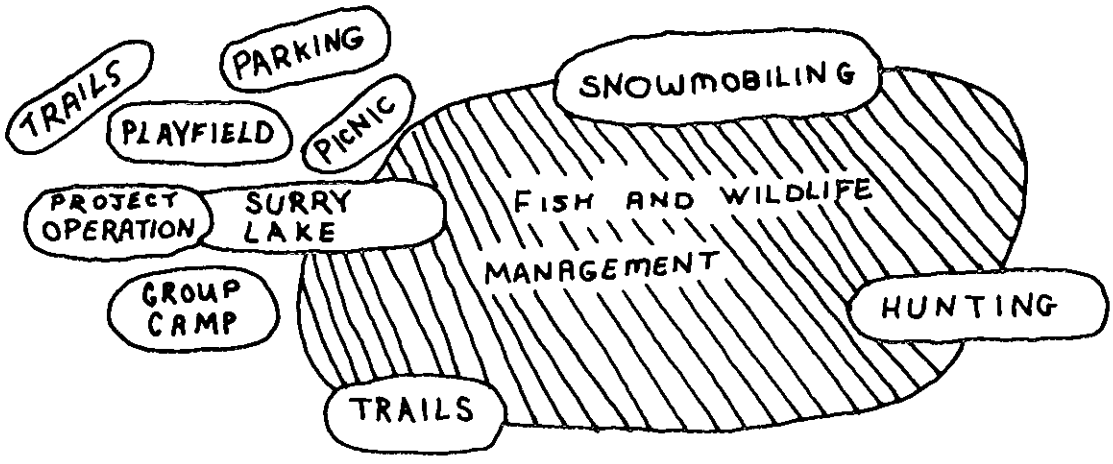


Figure 25 SCHEMATIC SITE PLAN

ities for snowmobilers and cross country skiers in the winter, and also offer an interesting hike along Surry Mountain to some of the old mine sites, historic logging areas and scenic lookout points. Some of the connecting spurs off this loop trail would tie into other existing trails on private land, thereby providing increased access for the public to the project area.

Representatives of both the town of Surry and the city of Keene have recommended that an informal group camping area be provided at Surry Mountain Lake for use by local clubs and other organized and supervised groups. It is proposed to locate this small camping area about 1/4 mile north of the dam on a relatively flat plateau above spillway crest elevation on the western flank of Surry Mountain. Access to this area will be over existing trails leading to the nearby powerline. The only facilities planned will consist of very informal pit latrines and a shelter to be provided by the interested local organizations on an as-needed basis. This campground will offer a semi-wilderness, primitive experience in a scenic, readily accessible area to many youngsters in nearby communities. The proposed multiuse trail around the lake will also pass by the camping area, offering an added attraction. The lake is also only about 100 yards away, which not only adds to the aesthetic qualities of the area, but also provides good fishing.

In addition to the proposed recreation improvements, a forestry management plan has been recommended by Corps rangers and project personnel to selectively cut, consistent with inventory data and competing uses, about 3 million board feet of timber on Surry Mountain over a period of ten years. This cutting is expected to enhance both the forestry and fish and wildlife resources of the project.

d. Cost Estimates

The following table lists the total expenditures to date for recreation development at Surry Mountain Lake, as well as estimated future costs for improvements as discussed in this Project Plan. It is expected that the future proposed development of new trails, the picnic shelter, horseshoe pits and the maintenance road over the dam would be provided by operation and maintenance funds as available, while facilities needed at the group campground, such as pit latrines and a shelter, would be provided by local interested groups and organizations in cooperation with the Corps of Engineers. It is anticipated that the proposed trail bridge over the Ashuelot River could be constructed in cooperation with an engineer unit of the Army Reserves or National Guard as part of a training exercise. Annual Corps of Engineers operation, maintenance and replacement costs for the existing and proposed recreation facilities are estimated at $50,000.

TABLE 3

ITEM	UNIT	UNIT COST	EXISTING QTY.	EXISTING COST	FUTURE QTY.	FUTURE COST	TOTAL QTY.	TOTAL COST
Boat Launching Ramp	LS	$7,000	1	$7,000			1	$7,000
Picnic Tables	EA	200	74	14,800			74	14,000
Fireplaces	EA	125	37	4,600			37	4,600
Parking Areas	LS	14,500	1	14,500			1	14,500
Access Roads	LS	23,000	1	23,000			1	23,000
Beach	LS	10,000	1	10,000			1	10,000
Storm Drainage	LS	9,000	1	9,000			1	9,000
Water Supply System	LS	14,900	1	14,900			1	14,900
Water Storage Tank	LS	2,000	1	2,000			1	2,000
Pressure Station	LS	2,900	1	2,900			1	2,900
Water Lines	LF	5	2,000	10,000			2,000	10,000
Drinking Fountains	EA	350	4	1,400			4	1,400
Water Supply Well	LS	4,300	1	4,300			1	4,300
Rest Rooms	EA	47,500	2	95,000			2	95,000
Change House	EA	30,000	1	30,000			1	30,000
Sewage Disposal System	LS	21,700	1	21,700			1	21,700
Site Preparation	LS	62,100	1	62,100			1	62,100
Topsoil, Seeding, Planting	LS	29,900	1	29,000			1	29,900
Miscellaneous Improvements	LS	14,900	1	14,900			1	14,900
Maintenance Road/Bike Path	LS	5,000	1		1	$5,000	1	5,000
Group Campground Facilities	LS	1,000	1		1	1,000	1	1,000
Multiuse Trail Improvements	LS	2,000	1		1	2,000	1	2,000
Trail Bridge	LS	2,000	1		1	2,000	1	2,000
Picnic Shelter	EA	1,000	1		1	1,000	1	1,000
Horseshoe Pits	EA	500	2		2	1,000	2	1,000
SUBTOTAL				$372,000		$12,000		$384,000
E+D & S+A				94,000		3,000		97,000
TOTAL COST				466,000		15,000		481,000

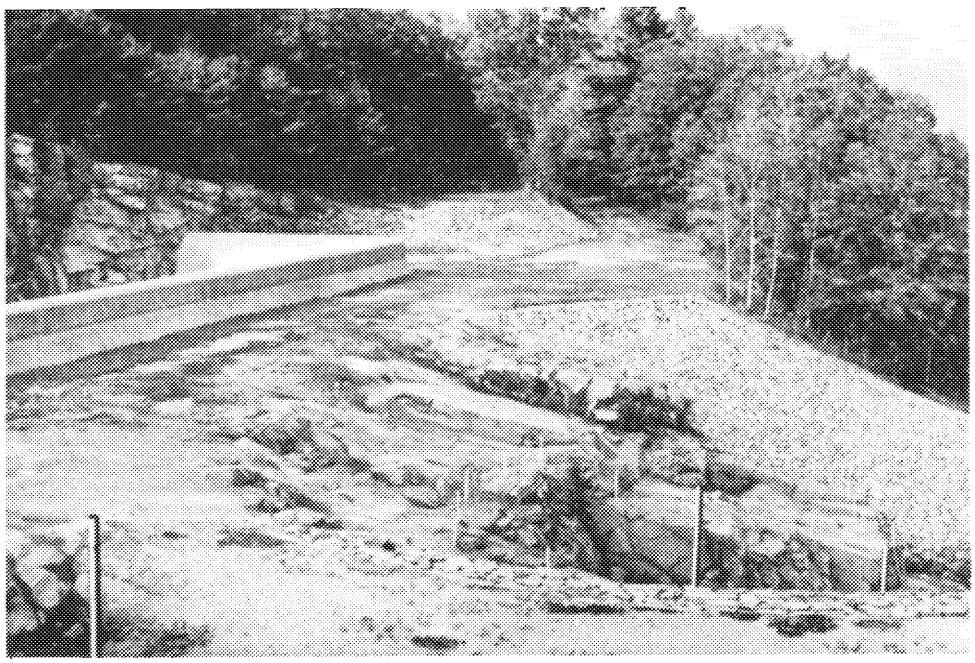


FIGURE 26 PROPOSED LOCATION OF BIKE PATH ACROSS SPILLWAY

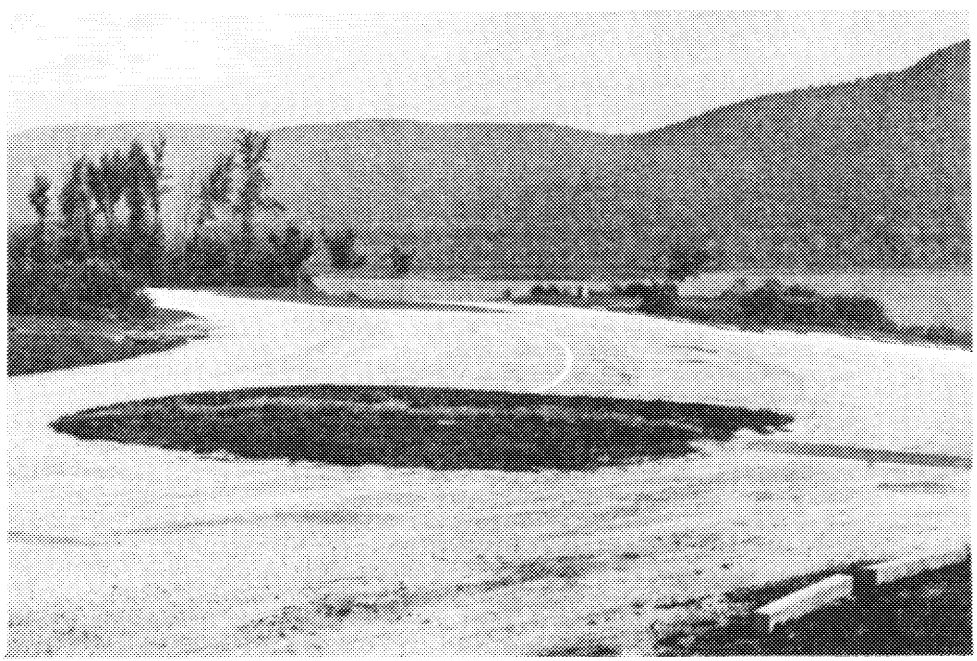


FIGURE 27 PARKING AND BOAT LAUNCH AREA

VII. FACILITY DESIGN RATIONALE

All future recreational development and management is planned with consideration given to environmental and aesthetic qualities, types of use, amount of visitation, and the ability of the area to assimilate activities with regard to overuse, incompatibility and congestion.

Existing sanitary facilities at the day-use recreation area are of the waterborne sewage type with flush toilets. They are of a concrete A-frame type construction which are designed to withstand inundation from flood control operations. One facility is located near the beach and serves both swimmers and picnickers. The second rest room is located near the boat launching ramp and also serves the point and upper picnic areas. A concrete A-frame style change house is also provided at the beach. All facilities are accessible to the handicapped.

Drinking water is supplied by four bubblers conveniently located in the day-use recreation area between the beach, boat ramp and picnic area. Water is provided by a well with a large storage tank, both of which are located above the spillway crest elevation west of the beach.

Each picnic area has been conveniently located at a scenic spot within walking distance of parking areas and suitable for use by the handicapped. Sturdy picnic tables and fireplaces are provided for each site, all of which are spaced to avoid over-development and congestion.

The reservoir access roads and former town roads serve as access for hunters, trappers and fishermen, and as multiuse trails for snowmobiles, bicycles, cross country skiers, horseback riders and hikers. The use of these trails and roads for different recreational purposes has been planned to insure adequate protection to wildlife and the environment and to minimize conflicts in usage. New multiuse trails will continue to be designed to accommodate all practical and desirable uses with consideration given to terrain, vegetation, slope and width.

The beach area has been designed with emphasis on safety. The gently sloping semi-circular beach offers good visibility and protection from powerboats. The swimming area is also enclosed by highly visible float lines which distinguish the area from the boating/waterskiing area. Surrounding the beach is a very large mowed grass area with scattered picnic tables and plenty of room for sunbathing, games and group activities.

The boat launching ramp is a dual concrete plank ramp which has been designed so that two boats can be launched simultaneously. The 12 percent slope and convenient turnaround and paved parking area make access to the lake very easy for all, which is especially important for elderly or handicapped persons.

The proposed bicycle path over the dam to the recreation area will be paved and sufficiently wide for project maintenance vehicles as well as bicycles and snowmobiles. With visitor safety again in mind, bike riders will be able to ride from the Keene area to Surry Mountain Lake over lightly traveled secondary roads and avoid Route 12A.

The proposed group camping area is planned for a relatively level, wooded area requiring only selective tree clearing. The primitive intent of this area will be maintained by providing only trail access and very rustic, informal facilities for occasional use by organized groups.

VIII. OPERATION AND ADMINISTRATION

The authorized purpose of Surry Mountain Lake is to act in conjunction with other flood control reservoirs in the Connecticut River Basin in providing flood protection to downstream damage centers primarily along the mainstem of the Connecticut River in Massachusetts and Connecticut. Management for recreation at the reservoir is a secondary priority that should remain compatible with the primary function of flood control. Within this context, management objectives for recreation are:

a. To encourage sustained public use up to the maximum attainable carrying capacity, consistent with aesthetic and ecological values.

b. To avoid or minimize use conflicts while developing project resources.

c. To be aware of and responsive to user needs and desires.

A staff consisting of a Project Manager and Assistant Project Manager is provided at Surry Mountain Dam to perform the continual operation and maintenance duties that are required. Three temporary employees and two park technicians are usually hired in the summer to aid and assist the Project Manager. In addition, a Corps of Engineers ranger from the Upper Connecticut River Basin office at North Springfield Lake makes regular patrols of the reservoir area to assist public visitors and enforce rules and regulations.

In addition to overseeing the operation of the dam, the field personnel supervise the use of lands and waters of the project, investigate and report on compliance with the terms of leases and permits, project and maintain government property, and enforce high standards of public health and safety.

Overall administration of the recreation and fish and wildlife management programs at Surry Mountain Lake is carried out jointly by the Corps of Engineers and the New Hampshire Fish and Game Department. The Corps of Engineers is concerned mainly with determining the nature and extent of development, preparing site layout plans and construction requirements, public relations with other interests and project management policies.

About 130 acres of federally owned land within the reservoir area is leased to local farmers for agricultural purposes. The New Hampshire Fish and Game Department is licensed to stock pheasants within the reservoir and is responsible for the enforcement of hunting, trapping and fishing regulations. It also oversees a wild turkey and cottontail rabbit habitat management program.

All laws and regulations concerning proper use of the project resources are enforced by the local police, fish and game conservation officers, and Corps of Engineers Rangers, with the Cooperation of the Project Manager.

SURRY MOUNTAIN LAKE

SURRY, NEW HAMPSHIRE

CONCEPTUAL PLAN

- PROJECT BOUNDRY
- MULTIUSE TRAIL
- (π) PICNIC AREA
- (B) BOAT LAUNCH
- (C) CANOE LAUNCH
- (F) FIELD SPORTS
- (O) OBSERVATION POINT
- (P) PARKING
- (R) WEAPONS RANGE
- (T) TRAIL INFORMATION
- GROUP CAMPING
- HUNTING

Coon Ledge

Wood Slide Car 1888

Beaver Pond

SCALE IN FEET
100 300 500 1500
0 200 400 1000

north

FIGURE 28

IX. RECOMMENDATIONS

The following improvements as proposed and discussed in this Project Plan are recommended in order to optimize and enhance, to the greatest extent reasonably practical, the recreation potential of Surry Mountain Lake.

1. Construct a project maintenance road over the western abutment of the dam from the vicinity of the gatehouse, around the intake channel, connecting to the former Route 12A. This road, which would also serve as an excellent bicycle path and snowmobile trail, would connect the project administration area and the popular day-use recreation area.

2. Create a group camping area located about 1/4 mile north of the dam on the western flank of Surry Mountain to be used by local, organized and supervised groups. This small campground would be primitive in nature with only the very basic facilities necessary for health and safety provided by local interests, such as a shelter and pit latrines.

3. Expand the multiuse trail system around the lake to serve hikers, snowmobilers, cross country skiers and to a lesser extent, horseback riders and bicyclists. This trail would require some selective clearing and a bridge crossing over the Ashuelot River, which could possibly be provided by the Army Reserves or National Guard.

4. Continue the present fish and wildlife management and enhancement programs in cooperation with the New Hampshire Fish and Game Department. The pheasant stocking and turkey management programs have been extremely popular and successful, and together with habitat management for cottontail rabbits provide important hunting opportunities.

5. Initiate a selective cutting and forestry management plan. Enhancement of wildlife habitat as well as prudent thinning of heavy timbered areas on Surry Mountain is planned by Corps rangers and project personnel as part of the overall project resource management program.

6. Continue the present leases for agricultural and other purposes. Existing agricultural leases benefit local farmers as well as the Corps and wildlife using the project area. The leases to the Surry Mountain 4-H Club and Keene Police Department provide a valuable public service to worthy local organizations and are in the public interest.

7. Improve the present day-use recreation area by providing a picnic shelter and horseshoe pits. These facilities would complement the existing picnic and play areas by offering shade and protection from inclement weather and additional recreation opportunities, especially for the elderly and handicapped.